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FAB 49

EGGS & POULTRY MEAT

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under the direction of

Commonwealth Agricultural Bureaux, Farnham Royal, Bucks; Gesellschaft für Information und Dokumentation, Frankfurt am Main; Institute of Food Technologists, Chicago; Centrum voor Landbouwpublikaties en Landbouwdocumentatie (Pudoc), Wageningen.

INTRODUCTION

Food Annotated Bibliographies (FABs) are collections of abstracts on specific topics in food science and technology. The topics are chosen by the staff of the International Food Information Service as being of particular interest or importance. The topics normally interest individual workers, who may not require the full information provided in Food Science and Technology Abstracts, from which the abstracts for FABs are taken. The size and the cost of the FABs are controlled as much as possible with the interests of individual workers in mind.

Titles of the FABs now available are given on the back cover of this booklet. For up-to-date lists of FABs or suggestions for new topics please write to the address on the back cover. New subjects are searched for at least the five most recent volumes of Food Science and Technology Abstracts. Thereafter each FAB is updated monthly. Copies of each months abstracts on any topic may be obtained as indicated on the back cover of this publication. At the end of each volume of up-dating, the abstracts are merged and made available as a separate supplement to the original FAB.

Some of the larger FABs have been divided into sections to facilitate use. FAB 47 also has a subject and author index provided.

Copies of all original articles referred to in the abstracts may be bought (or occasionally borrowed) from the International Food Information Service. A form for ordering these is provided at the end of this FAB.

Coverage of the subject has been restricted to that of Food Science and Technology Abstracts, which covers over 1200 of the important food journals, patents from 20 countries and books published world-wide. Every effort is made to include all significant references, but editorial discretion is used on the many articles of borderline interest. If the reader particularly needs an exhaustive search of the subject, we will be pleased to provide any other references that we have available. We would, in any case, encourage readers to write or telephone us with any comments or queries that they may have.

H. BROOKES

EDITOR

EGGS (General)

1

Distribution of injected ^{14}C -diethylstilbestrol in the chicken and laying hen. Whole body autoradiography and impulse counting.

Bengtsson, S. G.

Acta Veterinaria Scandinavica 19 (2) 254-262 (1978) [12 ref. En, sv] [Dep. of Anim. Hygiene, Coll. of Vet. Med., Swedish Univ. of Agric. Sci., Uppsala, Sweden]

8 two-wk old white leghorn chickens weighing about 130 g and 8-10 month old laying hens, live wt. about 1.5 kg, were fed a non-oestrogenic Swedish commercial feed mixture. Chickens and hens were given $40 \mu\text{Ci}$ [monoethyl- ^{14}C]diethylstilbestrol (DES)/kg body wt., often used as a feed additive in chicken production, by an injection in each thigh muscle. Radioactivity in tissues of chickens and laying hens, sacrificed 4 h after intramuscular injection of DES, was measured. Results of measurements show the following values ($10^{-3} \times \text{counts/min g}^{-1}$ wet wt.) for chickens and hens, resp.: liver, 162-170 and 103-138; body muscle, 6.3-8.2, and 2.4-2.9; gizzard, 3.0-3.6 and 5.4-5.9; and for eggs from the hens, yolk membrane 11.9-12.7; albumen, 0.2; and yolk, 0.01. It was concluded that consumer products based mainly on the liver from DES implanted or DES fed chickens should be avoided unless it has been shown that no active DES or DES-residuals occur in this organ. SP

2

Accumulation and depletion of some organochlorine pesticides in high-producing laying hens.

Kan, C. A.; Jonker-den Rooyen, J. C.

Journal of Agricultural and Food Chemistry 26 (4) 935-940 (1978) [24 ref. En] [Spelderholt Inst. for Poultry Res., Min. of Agric. & Fisheries, 7361 DA Beekbergen, Netherlands]

Addition of low concn. of organochlorine pesticides to the feed of high-producing laying hens for 16 wk had no influence on feed consumption, body wt., egg production, egg wt., and deformation of the egg. Accumulation ratios (concn. of the pesticide in the egg or fat to its concn. in feed) on fat basis were: hexachlorobenzene in egg 11, fat 13; α -hexachlorocyclohexane (α -HCH) in egg 2, fat 2; β -HCH in egg 13, fat 15; γ -HCH (lindane) in egg 2, fat 2; heptachlor(epoxide) in egg 5, fat 7; DDT (total in egg 10, fat 12; and dieldrin in egg 11, fat 14. $\leq 80\%$ of the pesticides ingested were excreted via eggs and faeces. Half-value times of depletion of residues (with uncontaminated feed for 12 wk) were 1.5-2 wk for α - and γ -HCH. The other pesticides have half-value times of about 6-8 wk. Correlations between concn. of pesticides in abdominal fat and in egg fat within hens are generally very high ($r > +0.9$). The same holds for correlations between concn. in abdominal fat and fat of the thigh muscle, breast muscle, liver, and egg. AS

3

[Control of aflatoxins in feeds and foods.] Zur Kontrolle von Aflatoxinen in Futtermitteln und Lebensmitteln. [Review]
Mücke, W.

Ernährungs-Umschau 25 (1) 9-15 (1978) [32 ref. De, en] [Kleiststrasse 20, D-8012 Ottobrunn, Federal Republic of Germany]

The problem of aflatoxin contamination of animal feed, and consequent contamination of human food is reviewed for meat, eggs and milk with reference to aflatoxin B_1 tolerances in Federal German feed regulations. Analysis of food and feed for aflatoxin contamination is described. It is concluded that feed regulations should specify tolerances for other aflatoxins as well as B_1 as at present, and that, because of the significance to infant feeding of the presence of aflatoxin M_1 in milk, tolerances for presence of this aflatoxin in milk and milk products should be established. DIH

4

Sectioning apparatus.

Jones, F. W. (Fasline Food Equipment Co.)

United States Patent 4 095 518 (1978) [En]

A device for sectioning rounded food articles, such as eggs, is described. IFT

5

[Use of a low-sodium diet for control of the laying pause of hens.] Die Anwendung ein er natriumarmen Ration zur Steuerung der Legepause bei Legehennen.
Bessel, W.

Archiv für Geflügelkunde 42 (3) 115-122 (1978) [34 ref. De, en, fr, ru] [Lehrstuhl für Kleintierzucht, Univ. Hohenheim, Postfach 106, 7000 Stuttgart 70, Federal Republic of Germany]

1600 HNL laying hens (after an initial 12 months of egg production) were used in a study on effects of feeding a low-Na diet for either 3 or 4 wk on subsequent laying performance and egg quality over 8 successive 4-wk periods. The low-Na diet induced a laying pause, after which the egg wt., shell strength and % shell increased and the elastic deformation value and % cracked eggs decreased, for various periods. Albumen height and albumen index increased for the first three 4-wk periods after the laying pause, then decreased, then increased again. Yolk colour decreased for the first 3 periods, then increased. Shell quality was higher for birds receiving the low-Na diet for 4 wk than for those receiving this diet for 3 wk. It is suggested that a low-Na diet may be a good method for induction of a pause in laying; the relatively long delay before re-establishment of laying is a disadvantage. AJDW

6

Rapeseed meal and egg taint: association with sinapine.

Hobson-Frohock, A.; Fenwick, G. R.; Heaney, R. K.; Land, D. G.; Curis, R. F.

British Poultry Science 18 (5) 539-541 (1977) [11 ref. En] [Chem. Div., Agric. Res. Council Food Res. Inst., Colney Lane, Norwich NR4 7UA, UK]

The fishy taint of brown-shelled eggs from susceptible birds, due to the presence of trimethylamine following the feeding of rapeseed meal, has been shown to be associated with the presence of sinapine [3-(4-hydroxy-3:5-dimethoxyphenyl)acrylic acid choline ester] in the rapeseed meal. AS

7

Forced moulting: one way to lower production costs. Bray, D. J.; Ridlen, S. F.; Johnson, H. S.

Poultry International 17 (5) 14, 16, 18 (1978) [En, fr, es, de] [Dep. of Animal Sci., Univ. of Illinois, Urbana, Illinois 60801, USA]

Studies were conducted on the effects of forced moulting on the egg yield, egg wt., Haugh score and shell thickness of White Leghorn pullets, over the 13-104 wk lay period. Half the birds were force-moulted at 36 and 70 wk of lay; the others were not force-moulted. The results show that force-moulting tended to increase egg yield and quality, but had little effect on egg wt. AJDW

8

[Delaunay SA, eggs and egg products.]

Mouchet, R.

Industries Alimentaires et Agricoles 95 (6) 611-621 (1978) [Fr]

This illustrated report on the Delaunay company covers its output, bacteriological and other controls, and the plants for producing egg products (frozen, liquid and dried) and packaging of fresh eggs (including "extra-fresh", sold within 1 wk of laying). The daily production is 1 million packaged eggs and 35 t of egg products. RM

9

[Cold store for eggs.]

Palanto, Yu. A.; Kondrashov, A. P.

Kholodil'naya Tekhnika No. 6, 12-14 (1978) [Ru] [Rosmyasomoltorg, USSR]

The lay-out and equipment of a cold store for 10 500 t of eggs is presented. The cold store has 5 floors, and includes the grading room and dispatching room. The cold cabinets may be used also for storage of packaged refrigerated products, e.g. meat, fish. The building, built from prefabricated reinforced elements, is insulated with foamed polystyrene. The cooling rate is 0.5° C/h. storage temp. -2° C with precooling to +2° C. The capacity of 5 ammonia compressors is 2083 kW (1800 thousand Kcal/h). All cabinets are air cooled. The temp. of the foundations below the cold store is kept at 1° C by electrical heating equipment. STI

10

Heritability of egg weight and its component traits.

Jain, G. L.

Indian Journal of Animal Sciences 44 (11) 881-883 (1974, publ. 1977) [10 ref. En] [Univ. of British Columbia, Vancouver, British Columbia, Canada]

This paper on the heritability of egg characteristics of a random-bred White Leghorn line includes mean values for various egg quality characteristics, including the following: egg wt. 58.15 g; yolk wt. 16.87 g; % yolk 28.75; albumen wt. 36.55 g; % albumen 62.43; shell wt. 5.17 g; % shell 8.80; % solids in yolk 53.30; % solids in albumen 11.63; % protein in yolk 16.89; and % protein in albumen 9.94. AJDW

11

Investigation on the mechanism of fouling of heat exchange surfaces by soluble proteins. [Lecture] Ling, A.; Lund, D. B.

International Congress of Food Science & Technology - Abstracts p.119 (1978) [En] [Dep. of Food Sci., Univ. of Wisconsin, Madison, Wisconsin 53706, USA]

A laboratory-scale stainless steel unit for study of fouling of heat exchange surfaces by proteins is described; flow rate, heat flux, heat exchange surface temp., fluid temp. and the nature of the treated surface may be controlled. Studies were conducted on fouling by dilute solutions of egg albumin. Fouling was shown to consist of 3 phases: an induction phase (heterogeneous nucleation), a constant growth rate phase and a falling growth rate phase. Results suggest that fouling is not diffusion controlled but reaction controlled. Arrhenius activation energy was approx. 40 kcal/mol, much less than the 136 kcal/mol for albumin denaturation. Order of reaction was 2.6. It is suggested that fouling can best be controlled by elimination of heterogeneous nucleation at the heated surface. [See FSTA (1979) 11 2A60.] AJDW

12

[Rigid egg box.]

Ducruet, R. P. (Societe ASA SA)

French Patent Application 2 367 682 (1978) [Fr]

A box which will retain its shape is moulded from expanded polyurethane. The lower part is moulded to the shape of 6 eggs. The upper part, which is flat and closes the box is hinged to one side of the lower part and engages with the other. W&Co

13

[Use of a lecithin-containing vegetable oil product in broiler and laying hen diets.] Der Einsatz eines lecithinhaltigen Pflanzenölsproduktes in der Broiler- und Legehennenfütterung.

Vogt, H.; Harnisch, S.

Archiv für Geflügelkunde 42 (2) 70-77 (1978) [8 ref. De, en, fr, ru] [Inst. für Kleintierzucht, Bundesforschungsanstalt für Landwirtschaft Braunschweig-Völkenrode, Federal Republic of Germany]

A 322-day laying hen feeding trial with diets containing the soybean lecithin preparation Biofosfatin at levels of 0, 3 or 6% is described. Effects on feed efficiency, laying performance and egg quality were evaluated. Tables of results are given. The results show significant effects of dietary Biofosfatin on the albumen index, the yolk index, yolk colour, fatty acid composition of yolk lipids and cholesterol content of the yolk, but no significant effects on shell strength, the foaming characteristics of the albumen, the moisture, total lipid, choline or P contents of the yolk, or the composition of the liver. A 7-wk broiler feeding trial showed no adverse effects of $\leq 4.5\%$ Biofosfatin in the diet on growth rate or feed utilization. AJDW

14

Dried rum distillery stillage in laying rations.

Diaz-Medina, M.; Randel, P. F.

Journal of Agriculture of the University of Puerto Rico 62 (2) 149-155 (1978) [9 ref. En, es] [Agric. Exp. Sta., Univ. of Puerto Rico, Rio Piedras, Puerto Rico]

Individually caged White Leghorn hens, Kimber strain, were fed isonitrogenous rations containing (i) 0, (ii) 5, (iii) 10, (iv) 20 or (v) 30% dehydrated rum distillery stillage. In a second experiment a ration without stillage was fed for a 12 day preliminary period, followed by rations containing (vi) 10, (vii) 12.5, (viii) 15, (ix) 17.5 or (x) 20% dried stillage. The data were treated by analysis of variance and multiple range test. Results of analysis were for (i)-(x) resp.: eggs laid/100 hen days (laying %), 81.0, 77.1, 75.2, 68.6, 58.1, 70.8, 65.4, 67.6, 67.4 and 65.1%; wt./egg, 62.3, 59.0, 58.5, 60.1, 56.5, 62.6, 62.3, 63.0, 63.2 and 59.9 g; and daily egg production, wt., 50.2, 45.5, 44.1, 41.2, 33.1, 44.1, 40.6, 42.6, 42.6 and 39.1 g. Treatment (v) was significantly inferior ($P < 0.05$) to (i), and (x) was significantly inferior ($P < 0.05$) to (viii) and (ix) for egg wt. However, all treatments resulted in adequate mean egg size. In total egg wt. production, (v) was significantly inferior ($P < 0.01$) to (i) and (ii) and (iii) significantly inferior ($P < 0.05$) to (iv), but there were no significant differences between (vi)-(x). It was concluded that with compensation for caloric dilution by addition of fat, dried stillage at levels $< 20\%$ may be used efficiently in layer rations. SP

15

Influence of high fibre contents in poultry rations on egg production.

Abdel-Rahman, M. M.

Indian Journal of Animal Sciences 45 (8) 567-569 (1975, publ. 1977) [5 ref. En] [Fac. of Agric., Shebin-El-Kom Univ., Cairo, Egypt]

62 Fayoumi hens (initially 6 months of age) were used in a 12 month feeding trial conducted to evaluate effects of diet on egg production and quality. 3 diets were tested, containing (i) 80% yellow corn, 10% decorticated cottonseed meal (DCSM) and 10% fish meal, (ii) 70% yellow corn, 10% DCSM, 10% sawdust and 10% fish meal; or (iii) 78.5% yellow corn, 10% DCSM, 10% sawdust and 1.5% urea. Tables of results are given, including data for egg quality and carcass characteristics. Egg wt. differed little between groups. Yolk % ranged between 35.29% for (iii) and 38.22% for (ii), with an overall average of 36.72%. Albumen % ranged between 51.11% for (ii) and 52.16% for (i), with an overall average of 51.77%. Carcass data show internal fat wt. and intestine wt. to be higher for (ii) and (iii) than for (i). AJDW

16

Lysozyme content of chick egg-white as related to the internal quality of eggs.

Goel, V. K.; Venugopalan, C. S.; Verma, S. S.

Indian Journal of Animal Sciences 45 (8) 570-571 (1975, publ. 1977) [6 ref. En] [Indian Vet. Res. Inst., Izatnagar 243 122, Uttar Pradesh, India]

50 hens from the purebred M strain and 114 from a White Leghorn cross were used in a study on the

relation between the lysozyme content of the albumen (determined by paper electrophoresis) and various egg quality characteristics (Haugh unit score, albumen index, yolk index, and egg wt.). A table of results is given. For the M strain, correlations between lysozyme concn. and all egg characteristics studied were non-significant. For the White Leghorn cross, lysozyme concn. was significantly related to Haugh unit score ($r = 0.747$) and to yolk index ($r = 0.591$), but not to egg wt. or albumen index. AJDW

17

Characterization of plastein reaction products formed by pepsin, α -chymotrypsin, and papain treatment of egg albumin hydrolysates.

Edwards, J. H.; Shipe, W. F.

Journal of Food Science 43 (4) 1215-1218 (1978) [22 ref. En] [Dep. of Food Sci., Cornell Univ., Ithaca, New York 14853, USA]

Gelled plastein reaction products were prepared by treating conc. peptic hydrolysates of egg albumin with pepsin, α -chymotrypsin, and papain. The relative firmness of these homogeneous gels was determined by comparing force-distance curves obtained from puncture tests made with the Instron Universal Testing Machine. Effects of the choice of enzyme and degree of substrate hydrolysis on the plastein yield (increase in 10% trichloroacetic acid precipitable material) and water solubility were investigated. Electrophoresis of plastein products in the presence of sodium dodecyl sulphate indicated that no high mol. wt., protein-like material was produced by the plastein reaction. It is suggested that plastein reactions lead to the formation of insoluble peptide aggregates, which are thought to be held together by noncovalent bonds rather than by covalent, peptide bonds, as reported previously. IFT

18

Changes of chalazae and vitelline membrane during storage of chicken egg. [Lecture]

Sato, Y.; Kato, T.

International Congress of Food Science & Technology - Abstracts p.168 (1978) [En] [Dep. of Food Sci. & Tech., Nagoya Univ., Furo-cho, Chikusa-ku, Nagoya 464, Japan]

The surfaces and transverse sections of chalazae, vitelline membrane and peri vitelline membrane (inner layer only) of eggs were studied by scanning electron microscopy. Studies were also made of the changes occurring in the amino acid and carbohydrate composition of these constituents during storage of eggs. The aim of the studies was to establish the relationship between the biochemical properties of these constituents and their changes during storage in relation to egg keeping quality. Results indicated that the chalazae and outer layer of the vitelline membrane are removed during storage. [See FSTA (1979) 11 2A60.] JA

19

Fishy taints in eggs. [Lecture]

Curtis, R. F.; Fenwick, G. R.; Hobson-Frohock, A.; Heaney, R.; Land, D. G.

International Congress of Food Science & Technology - Abstracts p.291 (1978) [En] [ARC Food Res. Inst., Colney Lane, Norwich, UK]

Occasional production of eggs with a fishy taint was first recorded in 1928. There is no evidence that it is associated with feeding fish meal. In 1972 large numbers of eggs with a 'crabby' or 'fishy' taint were produced in the UK. Only brown-shelled eggs were involved. Sensory examination of eggs coupled with GLC analysis showed that tainted eggs contained trimethylamine. The problem was shown to be associated with feeding rapeseed meal in the diet of certain types of hens. The special analytical methods used for the isolation and analysis of trimethylamine in eggs are described. Further investigations involving the fractionation of rapeseed meals and examination of the effect of various fractions on the laying hen have shown that sinapine, a well-known constituent of *Brassica* spp., is associated with the phenomenon. [See FSTA (1979) 11 2A60.] AS

20

Lipids and proteins in eggs and blood serum from two strains of hens.

Rotenberg, S.; Sorensen, P.

Acta Agriculturae Scandinavica 28 (3) 255-261 (1978) [18 ref. En] [Dep. of Anim. Physiol. & Chem., Nat. Inst. of Anim. Sci., DK-1958, Copenhagen V, Denmark]

This paper includes data for characteristics of eggs laid by 2 strains of White Leghorn hens, one selected for high rate of lay, the other selected for high egg wt.; tables of results are given for egg wt., yolk wt., albumen wt., solids in the albumen, protein in the albumen, protein in the yolk, wt., total lipids, total cholesterol and phospholipids in the yolk, albumen height, and the wt. of total lipids, phospholipids, cholesterol and triglycerides/egg. Correlation coeff. of production traits and various blood serum traits with egg quality characteristics are given. Eggs laid by hens selected for egg wt. had higher levels of protein, total lipid and cholesterol in the yolk than eggs laid by hens selected for rate of lay. AJDW

21

[Low-protein blended diets for young replacement poultry.]

Sirbu, M.; Damian, C.; Murarasu, D.; Colceriu, C.

Lucrarile Stiintifice ale Institutului de Cercetari pentru Nutritia Animalelor 6, 167-177 (1976) [13 ref. Ro, en, de, fr, ru]

A total of 1096 Leghorn pullets was used in studies on effects of high or low protein diets, based on vegetable protein alone or vegetable + animal protein, on laying performance and egg quality. Effects of amino acid supplementation of the low-protein vegetable protein-based diet were also studied. Tables of results are given, including data for egg yield, egg wt., egg shape, the % shell, egg contents, yolk and albumen, and the composition (including protein, fat, ash, carotene, N-free extract and vitamin A) of the eggs. The results show that the variables studied have relatively little effect on the egg quality characteristics considered. AJDW

22

The thiocyanate content of egg from hens fed on a diet containing rapeseed meal. [Lecture]

Shuaib, A. C. A.; Beswick, G.; Tomlins, R. I.

International Congress of Food Science & Technology - Abstracts p.247 (1978) [En] [Dep. of Applied Biol. & Food Sci., Polytech. of the South Bank, London SE1 0AA, UK]

The lactoperoxidase/thiocyanate/H₂O₂ system (LP system) is known to have an antimicrobial effect in milk and other biological fluids. A study was carried out to determine whether inclusion of 10% rapeseed meal in the diet of laying hens would increase the thiocyanate content of eggs to a level required by the LP system to promote bactericidal activity in egg products. Such an increase in the thiocyanate content was achieved; future studies will examine the possibility of using the LP system to cold-pasteurize liquid egg products. [See FSTA (1979) 11 2A60.] JA

23

[Persistence of residues of some antibiotics in meat and eggs.]

Ionova, I.; Zhecheva, G.

Veterinarnomeditsinski Nauki 14 (9) 59-66 (1977) [39 ref. Bg, ru, en] [Vet. Inst. po Zarazni i Parazitni Bolesti, Sofia, Bulgaria]

6 groups of 20 Leghorn broilers on customary rations received daily for 6 days (i) 57 p.p.m. erythromycin as Gallimycin (Abbott Laboratories), (ii) 50 p.p.m. tylosin tartrate as Tylan (Elanco Products), (iii) 40 p.p.m. oleandomycin (Farmakhim), (iv) 50 p.p.m. spectinomycin (Amdal), or (v) 50 p.p.m. chloramphenicol; a group of 30 broilers served as controls. Batches of 4 broilers from each group were killed 1, 2, 3 and 4 days after the end of antibiotic administration. Contents of antibiotic residues in muscles, liver and kidney are tabulated. (i)-(v) were present in all sites on the 1st day, (i)-(iii) in muscle at 0.15-0.17 µg/g, (iv) at 0.6 µg/g and (v) at 1.8 µg/g; (i)-(iii) and (v) disappeared from all sites after 2-3 days, and (iv) disappeared after 6 days. In several series of experiments, a total of 60 laying Leghorn hens received rations with 50-60 p.p.m. (i), (ii) or (v) for 8-25 days and eggs were collected for 8 days during treatment and 4 days thereafter. The antibiotics began appearing in egg white on the 2nd and in egg yolk on the 22nd days of administration, and persisted for 3 days after the end of administration. Max. concn. were 1 µg/g. SKK

24

[Methods for detection of antibiotic residues in meat, organs and eggs.]

Ionova, I.

Veterinarnomeditsinski Nauki 14 (10) 40-45 (1977) [18 ref. Bg, ru, en] [Tsentralen Nauchnoizsled. Vet. Med. Inst., Sofia, Bulgaria]

2-g samples of meat, organs and homogenized egg white and egg yolk of poultry that had not been treated with antibiotics or other drugs for 1 month were injected with solutions of each of 13 antibiotics to give contents graded in 21 steps from 0.05 to 10 µg. The Federal German standard method using *Bacillus*

mycoides HB₉, the Sarris & Jannaculas method [Zooprophylaxis (1970) 25, 3] using *Sarcina lutea*, the modified method of Druzhinina (no reference given) using *Bacillus subtilis*, the method of Kundrat [FSTA (1972) 4 10S1385] using *Bacillus stearothermophilus* var. *calidolactis*, the method of Obiger modified by Müller, using *B. stearothermophilus* var. *calidolactis*, and this method further modified by the author by using Petri dishes with a 40-million bacterial cell/ml suspension instead of plastics plates and freezing samples of meat and organs at -12°C to facilitate juice extrusion on defrosting, were compared for suitability and sensitivity in detection of antibiotic residues. The modified Müller method was found best. Penicillin, Streptomycin, Erythran, Gallimycin (erythromycin stearate), Tylan (tylosin) and oleandomycin were detected at $0.1\text{ }\mu\text{g/g}$; and Chlornitromycin, chlortetracycline, oxytetracycline, tetracycline, Tetraolean, Spectam, and Kanamycin were detected at $1.0\text{ }\mu\text{g/g}$. SKK

25

Gas-liquid chromatographic determination of volatile organic acids as benzyl esters with applications to tuna, shrimp, and eggs.

Staruszkiewicz, W. F., Jr.; Fernandez-Flores, E.; Bond, J. F.

Journal of the Association of Official Analytical Chemists 61 (4) 973-981 (1978) [26 ref. En] [FDA, Div. of Food Tech., Washington, DC 20204, USA]

Volatile acids are recognized as useful indicators of decomposition in a variety of foods. A method was developed for the rapid preparation of benzyl esters of formic, acetic, propionic, isobutyric, and butyric acids and for their quantitative detn. by GLC. Esters were formed by reaction with BCl_3 -benzyl alcohol, followed by washing with aqueous NH_3 before storage. They were chromatographed, using tetradeceane as an internal standard, and were separated at 140°C on columns having DC-200 and SP-1000 as liquid phases. The method offers significant advantages, especially for the detn. of formic acid, over the present official AOAC method, 17.042-17.046. Recoveries of volatile acids added to steam distillates of tuna extracts were $\geq 91\%$, with mean recoveries for the 5 volatile acids of 96-104%. Applications to the analysis of canned tuna, frozen headless shrimp, and frozen whole egg resulted in recoveries of $\geq 82\%$ with mean recoveries for the 5 acids of 91-101%. The method was compatible with an automated gas chromatograph-data processing system. AS

26

Excretion balance, metabolic fate, and tissue residues following treatment of lactating goats and laying hens with thidiazuron cotton defoliant.

Benezet, H. J.; Knowles, C. O.; Campbell, J. R.; Savage, J. E.

Journal of Agricultural and Food Chemistry 26 (3) 622-627 (1978) [3 ref. En] [Dep. of Entomology, Univ. of Missouri, Columbia, Missouri 65201, USA]

Thidiazuron (N-phenyl-N'-1,2,3-thiadiazol-5-ylurea) cotton defoliant was administered for 10 consecutive days to lactating goats and laying hens. The vast

majority of the radioactive material ($>70\%$) was eliminated in goat urine and faeces; $<1.5\%$ of the administered radioactivity was in the milk. Hens excreted 72% of the total consumed radioactive material during the 10-day feeding period. In addition to the parent compound, which was present in low levels in goat milk and in chicken excreta, eggs, liver, and kidney, N-4-hydroxyphenyl-N'-1,2,3-thiadiazol-5-ylurea or 4-hydroxyphenylthidiazuron was detected. 4-hydroxyphenylthidiazuron was the major thidiazuron metabolite and was present in the free and/or conjugated form in goat and hen excreta, milk, eggs, and certain tissues. Other unidentified compounds were also present. AS

27

Egg marketing in India.

Panda, P. C.

Poultry Guide 15 (5) 45-55 (1978) [En] [Anim. Products Tech., Haryana Agric. Univ., Hissar-125 004, Haryana, India]

Aspects covered are egg production in various states (India); and marketing aspects, such as grading and quality control, packaging and transport, storage, pricing, retail outlets, and market research. CFTRI

28

Bacon-and-egg bread . . . the great unmarketed product.

Hannigan, K. J.

Food Engineering International 3 (7) 18-19 (1978) [En]

A description is given of a loaf, containing identifiable pieces of egg and bacon, developed by Uncle Ben's, Inc., Houston, Texas, and which is the subject of a UK patent (application filed 1973) although the bread was never marketed. Two slices of the loaf contain the equivalent of 1 whole egg and 2 slices of bacon. 17% of the egg ingredient is added to the flour as raw egg to strengthen the dough; the remainder of the egg is scrambled. Loaves can be of the sandwich-type, for production of square slices to be sold frozen and heated in a toaster, or a Swiss-roll shape loaf with the egg and bacon as the filling may be produced. A recipe and baking instructions are given. DIH

29

[Packaging and storage of fertile eggs. I. Effects on internal quality and hatchability.]

Campos, E. J.; Baiao, N. C.; Ferreira, M. O. O.; Santos, M. W.; Caetano, A. L. S.

Arquivos da Escola de Veterinaria, Universidade Federal de Minas Gerais 30 (1) 53-60 (1978) [19 ref. Pl, en] [Escola de Vet., Univ. Fed. de Minas Gerais, Caixa Postal 567, Belo Horizonte, Brazil]

Studies were conducted on changes in internal quality characteristics (Haugh scores, albumen pH) of eggs stored for ≤ 14 days at $15-18^{\circ}\text{C}$ or $23-29^{\circ}\text{C}$; some eggs were oiled and/or packaged in plastics bags, others were neither oiled nor packaged in plastics bags. Tables of results are given. Haugh scores decreased during storage, the decrease being greater at $23-29^{\circ}\text{C}$ than at $15-18^{\circ}\text{C}$. Both oiling and packaging in plastics bags

reduced decreases in Haugh score; combination of both gave the best results. Albumen pH increased during storage; temp. had little effect on changes in albumen pH during storage. Oiling and packaging in plastics bags decreased changes in pH, the combined treatment having the greatest effect. AJDW

30

Survey for aflatoxin B₁ in chicken eggs.

Stoloff, L.; Trucksess, M. W.

Journal of the Association of Official Analytical Chemists 61 (4) 995-996 (1978) [8 ref. En] [FDA, Div. of Food Tech., Washington, DC 20204, USA]

Samples of egg products were obtained during Jan. and July 1977 from 35 establishments located in the southern part of the USA. Of the 112 samples analysed, aflatoxin B₁ was found in 1 sample of liquid egg white at a level of 0.06 ng/g. No aflatoxin was found in 101 samples of shell eggs offered for sale to consumers in Alabama, Georgia, S. Carolina, and N. Carolina in the late fall of 1977. AS

31

Preserving egg quality by cooling.

Bhatnagar, A. P.; Gupta, A. K.

Poultry Guide 15 (5) 65-72 (1978) [En] [Dep. of Processing & Agric. Structures, Coll. of Agric. Eng., Punjab Agric. Univ., Ludhiana-141 004, Punjab, India]

Preservation of egg quality by oil spray and refrigeration is discussed, together with cooling of eggs in small farms and on a commercial scale. A layout sketch of a typical egg cooling room is given. CFTRI

32

[Separation of yolk proteins from hens' eggs by TLC on Sephadex.]

Vitez, L.

Hrana i Ishrana 18 (11/12) 513-519 (1977) [9 ref. Sh, en] [Kemijski Inst. "Boris Kidric", Ljubljana, Yugoslavia]

Comparative studies on separation of egg yolk proteins by column chromatography on Sephadex G-100 and by TLC on Sephadex G-200 Superfine showed the TLC method to give better results (clear separation of 4 fractions, vs. 2 fractions separated by column chromatography). Experiments showed the 4th fraction (lipovitellin) to be dependent on the freshness of the yolk. This simple and rapid TLC technique may be used for detn. of changes in protein fractions during ageing or processing of eggs. IN

33

[Flavour and odour changes in poultry and poultry products due to chlorophenols and chloroanisoles.]

Dejouckheere, W.; Steurbaut, W.; Kips, R. H.

Revue de l'Agriculture 31 (2) 289-294 (1978) [11 ref. Fr] [Univ. de l'Etat a Gand, Coupure Links 533 B-9000 Ghent, Belgium]

Literature data on flavour and odour defects in the meat, skin and eggs of chickens housed on litters of tetra- or penta-chlorophenol-treated wood shavings or straw (methylated to the corresponding anisoles by bacteria in the litter) are reviewed. An additional source

of these compounds could be the animal carcass fat in the poultry feed. RM

34

[Rapid gas chromatographic determination of the coccidiostat Amprolium in eggs and poultry.] Rasche gaschromatographische Rückstandsanalyse des Coccidiostaticums Amprolium in Eiern und Geflügel. [Lecture]

Petz, M.; Thier, H.-P.

Lebensmittelchemie und Gerichtliche Chemie 32 (5) 103-104 (1978) [De] [Inst. für Lebensmittelchem., Univ., 4400 Münster, Federal Republic of Germany]

A rapid procedure for detn. of residues of Amprolium in eggs and in poultry tissues is described. The sample under test is homogenized and diluted with HCl; the resulting suspension is treated with sulphite, to split the Amprolium into the appropriate pyrimidinesulphonic acid and 2-picoline. The 2-picoline is separated by distillation, and determined by GLC using an N-specific thermionic detector, with 4-picoline as the internal standard. Trials with spiked samples show that, using this method, Amprolium residues can be determined rapidly and accurately at levels < 0.1 mg/kg. [See FSTA (1979) 11 4G288.] AJDW

35

Distribution of ochratoxin A in chicken tissues and eggs.

Frye, C. E.; Chu, F. S.

Journal of Food Safety 1 (2) 147-159 (1977) [23 ref. En] [Dep. of Food Microbiol. & Toxicology, Food Res. Inst., Univ. of Wisconsin, Madison, Wisconsin 53706, USA]

The kinetics of distribution of ochratoxin A (OA) in chicken tissues was studied. Day-old chicks were fed a starter diet alone or containing 1 p.p.m. OA. After 5 wk, all chicks were intubated with 50 µg ³H-OA/chick. The highest level of radioactivity was found in kidney and liver 8 h after intubation. Peak levels of OA in kidney, liver and breast were found to be 12, 4, and 0.2 parts/billion (p.p.b.) resp. Over 90% of the radioactivity was eliminated 48 h after intubation. Moreover, when laying hens were fed a diet containing 0.5 or 5.0 p.p.m. of OA for 2 wk, the highest levels of OA were also found in the kidney (124 p.p.b.) and liver (80 p.p.b.). Levels of OA in breast, leg and eggs of laying hens were found to be 8, 7, and 2.8 p.p.b. resp. AS

36

Accumulation of organochlorine pesticides in poultry: a review. [Review]

Kan, C. A.

Journal of Agricultural and Food Chemistry 26 (5) 1051-1055 (1978) [52 ref. En] [Spelderholt Inst. for Poultry Res., Min. of Agric. & Fisheries, 7361 DA Beekbergen, Netherlands]

Accumulation ratios (level of pesticide in fat or egg to its level in the feed) of hexachlorobenzene (HCB), α-, β-, and γ-hexachlorocyclohexane (HCH), heptachlor and its epoxide, DDT, dieldrin, aldrin, endrin, and methoxychlor in eggs, laying hens and broilers are discussed. The pesticides can be grouped into several categories according to accumulation ratios: highly

accumulating like HCB, β -HCH, heptachlor epoxide, dieldrin, aldrin; intermediate like heptachlor, endrin; low like α - and γ -HCH; and very low like methoxychlor. Depletion of residues of the pesticides in laying hens and eggs is correlated with the accumulative properties. Depletion of residues in broilers is mostly governed by growth rate and thus by dilution in the fat. AS

37

Distribution and metabolic fate of trans- and cis-permethrin in laying hens.

Gaughan, L. C.; Robinson, R. A.; Casida, J. E. *Journal of Agricultural and Food Chemistry* 26 (6) 1374-1380 (1978) [18 ref. En] [Pesticide Chem. & Toxicology Lab., Dep. of Entomological Sci., Univ. of California, Berkeley, California 94720, USA]

Radiocarbon from ^{14}C -carbonyl- and ^{14}C -methylene-labelled preparations of (1RS)-trans- and (1RS)-cis-permethrin, administered to laying hens for 3 consecutive days at 10 mg/kg for each dose, is largely eliminated from the body within 1 day after the last dose, a portion as $^{14}\text{CO}_2$. The excreta contain all and the eggs most of the following compounds identified by thin-layer cochromatography with authentic standards and specific enzymic hydrolysis: the unmetabolized pyrethroids; cis-permethrin hydroxylated at the 4'-position, at the methyl group trans to the carboxyl, and at both of these sites; the dichlorovinyl acids and their derivatives hydroxylated at the trans or cis methyl group; phenoxybenzyl alcohol, phenoxybenzoic acid and their 4'-hydroxy derivatives; and sulphate, glucuronide, taurine, and other conjugates of these alcohols and acids. Residues of unmetabolized trans- and cis-permethrin in fat are 0.15 and 0.93 p.p.m., resp., at 7 days after the last dose, and in eggs they reach peak levels of 0.3 and 1.2 p.p.m., resp., at 3-4 days after the last dose. AS

38

The egg: a special product that requires specialized packaging.

Donaldson, I. S.; Legge, D. *Packaging Review, UK* 97 (7) 73-74, 76, 79, 81, 83-84 (1977) [En] [Queen's Univ., Belfast, UK]

The development of the egg pack is outlined, and some typical 6-egg packs in use are described, together with some experimental packs and some common types of outer pack (e.g. wire pallets, shrinkwraps, trays). HBr

39

Agronomic evaluation of *Stylosanthes guyanensis* and its use in the diet of laying hens.

Onwudike, O. C.; Adegbola, A. A. *Journal of Agricultural Science, UK* 91 (3) 661-666 (1978) [17 ref. En] [Dep. of Anim. Sci., Fac. of Agric., Univ. of Ife, Nigeria]

Stylosanthes guyanensis (stylo) is an important forage legume locally available in Nigeria. The effect of increasing the proportion of stylo meal (0-20%) in the diet on the performance of 432 laying pullets was studied. Addition of > 10% stylo meal to the diet

significantly ($P < 0.01$) depressed egg production. But yolk colour, concn. of vitamin A in yolk and % egg hatchability were significantly improved with increasing stylo additions < 20%. AL

40

Musty eggs and broiler meat.

Bemelmans, J. M. H.

Poultry International 17 (3) 62, 64 (1978) [En, de, it, es, fr]

Problems with an offensive musty smell and flavour in eggs and poultry meat, attributable to tri- and pentachloroanisoles present in wood shavings used as litter are considered. These chloroanisoles are formed by moulds (*Penicillium*, *Scopulariopsis* and *Aspergillus* spp.) from tetra- and pentachlorophenols (used as wood preservatives) present in the shavings. Chloroanisoles are relatively unstable; their concn. in eggs and meat decrease to undetectable levels after 8-9 wk. Likely concn. of chloroanisoles in wood shavings and in the eggs and meat of poultry reared thereon are discussed, in relation to the taste and odour threshold concn. of these compounds. AJDW

41

Effect of deep litter system on physical properties of eggs from different breeds.

Gado, M. S. A.; El-Aggory, S. M. A.; Kamar, G. A. R. *Annals of Agricultural Science, Moshtohor* 6, 211-220 (1976) [25 ref. En, ar] [Fac. of Agric. Sci., Moshtihor, Helwan Univ., Egypt]

The effect was studied of 3 deep litter systems, (i) wheat straw, (ii) sawdust and (iii) sugar cane bagasse, and (iv) a free range system on the physical properties of eggs laid by Leghorn and Rhode Island Red hens. Properties studied after 30, 60 and 90 days were egg wt. egg index, wt. % of albumen, yolk and shell, wt. of thick and thin albumen, albumen index, yolk index, shell thickness and pores/cm². Tabulated results show that: egg quality improved with time on experiment; egg quality was lowest with (iv) and best with (iii); wt. % of shell showed less response to treatments than wt. % of yolk or albumen; and the deep litter system had no effect on shell thickness but increased porosity. AL

42

Restricted feeding of egg-strain chickens during growth and throughout an extended laying period.

Robinson, D.; Horsnell, G.; McMahon, P. J. *Australian Journal of Experimental Agriculture and Animal Husbandry* 18 (94) 658-666 (1978) [20 ref. En] [Dep. of Agric., Seven Hills, NSW, Australia]

Groups of White Leghorn \times Australorp pullets were fed ad lib. or at a restricted level (calculated to give a body wt. 80% that of ad lib.-fed birds) from 8 to 20 wk of age. Both the ad lib.-fed and the restricted-fed groups were then subdivided into groups fed ad lib., or at reductions of 3, 6, 12 or 24% of the ad lib. level. Tables of data are given for body wt., laying performance and egg quality over the period up to 90 wk of age. The results show that: Haugh score was not significantly influenced by the dietary variables studied; % cracked eggs was significantly influenced only by feed allowance over the period 20-90 wk of age; egg sp. gr.

was significantly influenced by feed allowance over the age ranges 8–20 and 20–90 wk of age, but not by their interaction; and yolk colour score was significantly influenced only by the interaction of feed allowances over these 2 age ranges. AJDW

43

Interior egg quality: improvement by distillers feeds and trace elements.

Jensen, L. S.; Chang, C. H.; Wilson, S. P.

Poultry Science 57 (3) 648–654 (1978) [10 ref. En] [Dep. Poultry Sci., Univ. of Georgia, Athens, Georgia 30602, USA]

The effect of including distillers dried grains with solubles (DDG/S), additional trace minerals, and other supplements in a corn-soy ration for laying hens on changes in interior egg quality as measured by Haugh units was investigated. In a 1st experiment, both 10% DDG/S and 10% brewers dried grains significantly increased Haugh units. In a 2nd experiment Haugh units were again significantly increased by 10% DDG/S but this supplement did not counteract a marked depression in Haugh units caused by adding 20 mg V/kg to the diet. Feeding different levels of DDG/S in a 3rd experiment showed that a level of 2.5% significantly increased Haugh units but a level of 10% was needed for max. response. Adding extra trace elements but not doubling the vitamin premix, significantly increased Haugh units. In a 4th experiment, adding extra Fe, Cu, Zn Mn, and Se significantly increased Haugh units, but V, Sn, Ni, and Mo did not. Neither DDG/S nor distillers dried solubles significantly affected Haugh units in a 5th experiment. The results of these experiments show that feed ingredients such as DDG/S and brewers dried grains contain a factor that generally improves interior egg quality and suggest that the factor may be a trace element(s). AS

44

[Survey of methods for long term storage of poultry eggs. XI. Differences in nutritional value and preservation of interior quality between fertile and infertile eggs.]

Tanabe, H.; Ogawa, N.; Hayakawa, H.; Sekiya, R.
Japanese Poultry Science [Nihon Kakin Gakkai-shi] 14 (6) 292–295 (1977) [4 ref. Ja, en] [Dep. of Human Nutr., Fac. of Home Economics, Gifu Women's Coll., Taromaru, Gifu 501-25, Japan]

Mostly fertile eggs which were collected from White Leghorn laying hens inseminated artificially with 0.02 ml cock semen/hen, and infertile eggs which were collected from another flock of White Leghorn laying hens, were analysed for moisture, crude protein, crude fat and crude ash concn. No difference was observed in the compositions of egg white and yolk between the 2 groups except in the case of crude protein in egg white in which the concn. was higher in the infertile eggs. No difference was observed between the 2 groups in the preservation of interior quality of eggs stored for 1, 5, 10, 20, 30, 40, 60, 80 and 100 days either in a non-air-conditioned room or in a box kept at 25° C. [See FSTA (1977) 9 1Q3 for part X.] AS

45

Canadian study shows egg quality benefits of oiling.
Hill, A. T.

Feedstuffs 50 (45) 13–14 (1978) [En]

A study on the effect of oiling on the quality of eggs during storage for ≤26 days is described. The eggs studied had been laid by hens of various ages over the range 2–14 months of lay. Albumen cloudiness was not obvious or objectionable in oiled eggs. Oiling reduced yolk mottling, wt. losses and decreases in Haugh score by approx. half, as compared to non-oiled eggs. Haugh score of the eggs decreased with increasing hen age. Oiled eggs laid by young, medium and old hens retained grade A quality for 26, 19 and 12 days, resp. No salmonellae or other pathogens were detected in the eggs studied. Possible desirable changes in the egg grading regulations in Canada are considered. AJDW

46

Acceptability of pickled quail eggs and salted chicken eggs.

Viajedor, G.; Davlay, D.; Gonzales, R. R.

Philippine Journal of Veterinary and Animal Sciences 2 (2) 89–93 (1976) [6 ref. En] [Univ. of the Philippines at Los Banos, Laguna, Philippines]

A semi-trained 10-member panel was used to evaluate the acceptability of hard-boiled quail eggs pickled for 2 days by 4 different recipes (as dark and spicy eggs, dilled eggs, sweet and sour eggs, or Kansas spicy eggs) and of hens' eggs salted in saturated brine for 10, 12, 14, 16 and 18 days and then boiled. The eggs were evaluated for saltiness, flavour and overall acceptability. Tabulated results showed that the most acceptable quail eggs were sweet and sour and plain hard-cooked eggs. The 3 other pickled products had an undesirable sour flavour. Salt content of the albumen of hens' eggs increased with salting time from 0.39% (unsalted) to 2.35% (18 days' salting). Eggs salted for 14 days were preferred for saltiness and flavour. RM

47

Two decades of animal breeding.

King, J. W. B.

Span 21 (2) 64–65 (1978) [En] [ARC Anim. Breeding Res. Organisation, Edinburgh, UK]

Contributions of genetic science to animal breeding are reviewed; achievements have varied considerably between spp. and are also linked with nutritional improvements. Poultry provide the prime example, with chicken now the cheapest available meat plus greatly increased egg supplies in most countries. The next example, less spectacular, is the pig. This is attributed to growing replacement of progeny testing by performance testing of potential breeding animals before they are used; major effort is devoted to improving carcass quality, particularly reduced fatness combined with methods of measuring fatness of the live animal. With cattle the full impact of artificial insemination has produced genetic gains of 1% in fat and milk yield, which are still increasing, in this case by progeny testing and selection of bulls by performance

of the daughters. With beef cattle progress has been less marked, but as with pigs the major objective is to avoid excessive production of fat. Of all farm animals in recent yr, the sheep has felt the least impact of genetic development. ELC

48

The preparative isolation of lecithin.

Radin, N. S.

Journal of Lipid Research 19 (7) 922-924 (1978) [1 ref. En] [Mental Health Res. Inst., Univ. of Michigan Med. School, Ann Arbor, Michigan 48109, USA]

Lecithin can be prepared on a relatively large scale, free of coloured impurities, by a simple 2-column procedure. Commercial crude egg lecithin is partially purified by a single-step passage through an alumina column. It is then purified by a 2-step passage through a prepacked, commercial silica gel column. The lecithin is prepared in solvent-free form for weighing by freeze-drying from cyclohexane. Toxic solvents (chloroform and methanol) are avoided by the use of ethanol, isopropanol, hexane and water. The elutions are easily monitored by a flow cell in an ordinary spectrophotometer set at 215 nm. Study of the column parameters has made it possible to use heavy loads with a relatively small column and minimal solvent. AS

49

[Diethylstilboestrol residues in chickens and their effect on DNA repair.] Diäthylstilböstrol - Rückstände im Huhn und ihr Einfluss auf Desoxyribonucleinsäure-Reparaturvorgänge.

Hruby, E.

Wiener Tierärztliche Monatsschrift 65 (8/9) 261 (1978) [De]

Diethylstilboestrol (DES) residues and effects on DNA repair were determined in the tissues and eggs of chickens after administration of tritiated DES. The highest residue levels were observed in the carcasses on the 2nd day after administration, falling to <0.1% (of applied dose) on the 19th day except for blood, muscle ($0.60 \pm 0.19\%$) and bones. Max. value in egg yolk was 0.01% on the 6th and 7th days, falling to <0.003% on the 11th day; max. value in egg white was 0.005% on the 2nd-5th days. While some DES residues were detectable 3 wk after administration, their levels in eggs and carcasses are too low to constitute a health hazard under normal consumption patterns. RM

50

Toxicity, accumulation, and depletion of hexachlorobenzene in laying chickens.

Hansen, L. G.; Dorn, S. B.; Sundlof, S. M.; Vogel, R. S. *Journal of Agricultural and Food Chemistry* 26 (6) 1369-1374 (1978) [14 ref. En] [Coll. of Vet. Med., Div. of Vet. Toxicology, Univ. of Illinois, Urbana, Illinois 61801, USA]

Groups of 20-wk old laying pullets were fed 7 daily doses of hexachlorobenzene (HCB) in the range 1-100 mg/kg body wt. Effects on performance and residue contents of tissues and eggs were studied at various times after drug treatment. HCB residues in hen tissues are tabulated for 1, 10 and 100 mg/kg treatments, 1 or

15 days after the 7 doses were received. Residues accumulated mainly in fat and skin, and relative accumulation decreased with increasing dose. Mean HCB residues in egg yolks 43 days after 7 daily doses of 0, 1, 10 and 100 mg HCB/kg were 0.3 ± 0.1 , 1.6 ± 0.4 , 20 ± 9 and 54 ± 11 p.p.m., resp. Elimination rates from fat remained constant with dose level under the conditions studied (≤ 80 days after HCB doses) giving a half-life of elimination of 24-27 days. The half-life of elimination in eggs was 41 days, and excretion of the parent compound in eggs was responsible for >50% of elimination from hen tissues. DIH

51

Restricted feeding and different protein levels to two strains of SCWL hybrids. I. Effects on egg production.

Elwinger, K.; Andersson, K.

Swedish Journal of Agricultural Research 8 (4) 231-240 (1978) [33 ref. En] [Dep. of Anim. Husbandry, S-75007 Uppsala, Sweden]

2 studies, each involving 1620 Single Comb White Leghorn hens of the strains Shaver Starcross 288 and Lohmann Selected Leghorn, were conducted on effects of level of feeding (ad lib. or restricted from 35 wk of age) and protein content of the diet (13, 15 or 17%) on laying performance, egg wt., abdominal + visceral fat quantity, and liver appearance. The results show that egg yield and wt. are adversely influenced by restricted feeding and low dietary protein concn. Restricted-fed birds had significantly less abdominal fat than ad lib.-fed birds. Hens receiving the 13% protein diet had poorer liver appearance than those fed higher protein levels. [See following abstr. for part II.] AJDW

52

Restricted feeding and different protein levels to two strains of SCWL hybrids. II. Effects on egg composition.

Andersson, K.; Elwinger, K.; Pamlenyi, I.

Swedish Journal of Agricultural Research 8 (4) 241-247 (1978) [39 ref. En] [Dep. of Anim. Husbandry, S-75007 Uppsala, Sweden]

Groups of Single Comb White Leghorn hens were used in 364-day laying studies [see preceding abstr. for details] on effects of feed allowance and protein level on egg quality. Tables of data are given for egg wt., shell deformation value and thickness, Haugh unit scores, DM, protein and fat contents in liquid whole egg and yolk, DM and protein contents of the albumen, and yolk wt. as % egg wt. Effects of hen age, hen strain, feed allowance and dietary protein concn. on egg quality are discussed in detail. Shell quality was significantly influenced by all factors studied. Haugh scores were influenced by hen age, strain and dietary protein level. DM concn. in liquid egg was influenced by hen age, feed allowance and age \times dietary protein interaction. Protein concn. in liquid egg was influenced by age, strain, dietary protein and protein \times age interaction. Fat content in liquid egg was influenced by all factors studied or their interactions. % yolk and compositions of yolk and of albumen tended to be influenced by all factors studied, except feed restriction. AJDW

53

Effect of varied protein levels with synthetic amino acids on performance of layers and egg quality.

El-Boushy, A. R.; Mulwijk, I.

Feedstuffs 50 (44) 15-16, 50 (1978) [18 ref. En] [Dep. of Poultry Husbandry, Agric. Univ., Wageningen, Netherlands]

288 crossbred medium-heavy layers were used in a study on effects of dietary protein level (11, 13, 15, 17 or 19% throughout the trial; or step-up regimes of 11/13/15%, 13/15/17% or 15/17/19% over the periods 21-34 wk/35-48 wk/49-62 wk) on egg quality. The diets were fortified with methionine and lysine. Tables of results are given, including data for egg, yolk, albumen and shell wt., and yolk, albumen and shell %. The results show no significant effects of dietary protein level on egg wt., yolk wt., yolk %, or shell wt.; albumen wt., albumen % and shell % varied significantly, but without any clear trend between dietary protein levels. AJDW

54

Effects of rapeseed meal on laying hens (*Gallus domesticus*) in relation to fatty liver-haemorrhagic syndrome and egg taint.

Pearson, A. W.; Butler, E. J.; Curtis, R. F.; Fenwick, G. R.; Hobson-Frohock, A.; Land, D. G.; Hall, S. A.

Research in Veterinary Science 25 (3) 307-313 (1978) [40 ref. En] [Houghton Poultry Res. Sta., Huntingdon, Cambs., UK]

Starcross 585 laying hens were fed wheat/maize diets with either 10% added *Brassica napus* rapeseed meal or an equal quantity of soybean meal. The trimethylamine content of eggs was evaluated in screening trials (using a 10% rapeseed meal diet) when the hens were 25-26 wk old, and after receiving diets with or without rapeseed meal for ≤ 15 wk. The results show that eggs laid by hens fed the rapeseed meal-free diet had very low trimethylamine concn. (0.03 $\mu\text{g/g}$ after 15 wk), irrespective of whether they were classified as 'tainters' or 'non-tainters' in the screening trial. Results for eggs laid by hens fed the diet with 10% rapeseed showed that those laid by hens classified as 'tainters' in the screening trial contained 1.25 μg trimethylamine/g after 8 wk and 1.03 $\mu\text{g/g}$ after 15 wk, vs. 0.27 and 0.31 $\mu\text{g/g}$ for eggs laid by hens classified as 'non-tainters'. The possible relationship of altered trimethylamine concn. and egg taint to the fatty liver/haemorrhagic syndrome and thyroid hypertrophy is discussed. AJDW

55

Determination of streptomycin residues in eggs and stability of residues after cooking.

Inglis, J. M.; Katz, S. E.

Journal of the Association of Official Analytical Chemists 61 (5) 1098-1102 (1978) [12 ref. En] [Rutgers State Univ., Cook Coll., New Brunswick, New Jersey 08903, USA]

An assay procedure for streptomycin was developed, using a surfactant-pH 8 buffer extraction, heating at 85° C to eliminate inhibition from lysozyme activity, and centrifuging to remove physical barriers to diffusion. Recoveries of streptomycin from supplemented eggs averaged 42% over the range 0.33-2.05 μg streptomycin/g egg. Eggs were supplemented at 3.0,

30.0, and 300 μg streptomycin/g and subjected to various cooking procedures, i.e. frying, poaching, scrambling, and hard boiling. There was little or no loss of activity as a result of the various cooking procedures with the exception of 1 of the hard boiled var. where there was a 40% loss only at the 3.0 $\mu\text{g/g}$ supplementation. Streptomycin residues were quite stable to normal egg preparation procedures. [See also following abstr.] AS

56

Determination of neomycin residues in eggs and stability of residues after cooking.

Katz, S. E.; Levine, P. R.

Journal of the Association of Official Analytical Chemists 61 (5) 1103-1106 (1978) [12 ref. En] [Rutgers State Univ., Cook Coll., New Brunswick, New Jersey 08903, USA]

The procedure for neomycin residues used a surfactant to improve extraction, a centrifuge step to eliminate solids that interfere with the diffusion of the antibiotic, and a heat treatment to destroy interfering lysozyme activity. The use of *Bacillus stearothermophilus* and a 65° C incubation yielded a rapid assay with a sensitivity of 0.2 μg neomycin activity/g egg. Frying eggs caused little or no loss of activity, poaching resulted in 26% loss, and soft boiling and hard boiling caused little or no loss of applied activity. Neomycin residues in eggs were quite stable to normal egg preparation procedures. [See also preceding abstr.] AS

57

Replacement of groundnut cake by dried poultry manure in the diets of laying hens.

Ogunmodede, B. K.; Afolabi, S. O.

British Poultry Science 19 (2) 143-147 (1978) [9 ref. En] [Dep. of Anim. Sci., Univ. of Ibadan, Ibadan, Nigeria]

The effect on food consumption by Harco, Amokathline and Hyline pullets when dried poultry manure (DPM) replaced part of dietary groundnut cake depended on the strain of the birds: in 2 of the 3 hybrids food consumption was not affected when up to 100 g DPM/kg was fed. Increases in food consumption were accompanied by increases in egg production. The food required/dozen eggs was improved by ≤ 100 g dietary DPM/kg and variation in the sizes of eggs laid depended on the hybrid. Concn. of DPM up to 100 g/kg did not affect the water-soluble N content of the egg but the crude albumen N content was depressed at concn. ≥ 80 g/kg. Feeding DPM to laying pullets depressed body wt. Presence of DPM in the diet resulted in higher concn. of lipid in the eggs. AS

58

Effect of dietary fibre on the performance of laying hens.Deaton, J. W.; Kubena, L. F.; Reece, F. N.; Lott, B. D. *British Poultry Science* 18 (6) 711-714 (1977) [10 ref. En] [South Cent. Poultry Res. Lab., USDA, P.O. Box 5367, Mississippi State, Mississippi 39762, USA]

Hy-line pullets were fed a basal diet (fibre content 25.5 g/kg diet) supplemented with 0, 15, 30 or 60 g shavings/kg, or a high energy basal diet (fibre content 22.8 g/kg diet). As dietary fibre content increased, gizzard wt. increased but there was no effect on body wt., hen-day production, egg wt., efficiency of food conversion, or egg shell breaking strength. The average shell breaking strength was however increased in the high-energy basal group. VJG

59

Effect of oiling on internal quality of eggs stored at 28° and 12° C.

Sabrani, M.; Payne, C. G.

British Poultry Science 19 (5) 567-571 (1978) [16 ref. En] [Univ. of Sydney, Poultry Husbandry Res. Foundation, Camden, NSW, 2570, Australia]

Effects of spraying linseed oil on naturally clean eggs, subsequently stored for 24 days at 28° C (temp. similar to those found in parts of Indonesia and other developing countries), were studied. Experiment 1 was a factorial design of 2 storage temp., 2 oiling treatments (unoiled and oiled), 2 ages of hen and 6 observation periods (2, 4, 6, 12, 18 and 24 days). Albumen height (Haugh units) and pH were measured. In a 2nd experiment under similar conditions wt. loss and foaming properties of eggs were investigated. Oiling slowed the decline of albumen height to that which occurred in unoiled eggs stored at 12° C; slowed the increase in albumen pH equally at 28° and 12° C; and markedly decreased the wt. loss of eggs stored at either temp. Oiling and storage temp. were without effect on the whipping vol. of either albumen or unseparated albumen and yolk. It was concluded that spray-oiling offers a satisfactory alternative to storage under cool conditions (12° C). This may be economically important in countries where cool storage is not possible. VJG

60

Fumigation of poultry food with methyl bromide: effects on egg flavour, number and weight.

Cooper, D. M.; Griffiths, N. M.; Hobson-Frohock, A.; Land, D. G.; Rowell, J. G.

British Poultry Science 19 (4) 537-542 (1978) [5 ref. En] [Houghton Poultry Res. Sta., Houghton, Huntingdon PE17 2DA, UK]

Rhode Island Red females were fed, from hatching, diets which had been fumigated with methyl bromide at the concn. recommended for elimination of salmonellae or at 1½ times this value. Body wt., egg wt. and egg number were not significantly affected by treatments. There was some evidence of an adverse effect on egg flavour. Although the higher proportion of tainted eggs from birds on fumigated diets was not significant, a smaller second experiment, which demonstrated loss of taint in eggs when the diet of the birds was changed from treated to untreated food, supported the observed difference in the main experiment. The laboratory panel detected taint in ≤ 15% of the eggs. This would be regarded as unacceptably high in a representative sample from the general public but in fact the detection rates were much lower in the 2 home panels. The highest % of eggs regarded as being of 'poor' quality was 8%. VJG

61

Comparisons of frequencies and egg shell characteristics of broken and intact eggs within diverse populations of chickens.

Siegel, P. B.; Middelkoop, J. H. van; Reddy, P. R. K.

British Poultry Science 19 (4) 411-416 (1978) [17 ref. En] [Poultry Sci. Dep., Virginia Polytech. Inst. & State Univ., Blacksburg, Virginia 24061, USA]

Differences were found among 8 populations of White Plymouth Rock pullets in the frequency of broken eggs. The shells of such eggs were thinner than those of intact eggs in 7 of the populations. The number of defective eggs, the sp. gr. of the eggs, and the % hen-day egg production of normal eggs were significantly correlated within populations with the incidence of broken eggs. No significant correlations were found within populations between the incidence of egg breakage and either egg wt., body wt., or shank length. AS

62

Relationship between some egg quality traits and egg production in chicken.

Mitra, A.; Patra, B. N.; Bala, M. K.; Panda, G. M.

Indian Journal of Poultry Science 12 (4) 76-79 (1977) [8 ref. En] [Orissa Univ. of Agric. & Tech., Bhubaneswar, Orissa, India]

Using data from the Eleventh Missouri Random Sample Egg Production Test, the coeff. of a regression equation between the number of eggs produced (Y) and the independent variates-egg wt. (x_1), albumen height in mm (x_2), Haugh unit score (x_3), sp. gr. (x_4), blood spots in % (x_5), and meat spots in % (x_6) have been calculated. The only significant correlation was that between sp. gr. and number of eggs produced; a decrease of 0.01 in sp. gr. was associated with an increase of 5.67 in the number of eggs produced. The low sp. gr. of eggs of high producers may be attributed to a lesser deposition of Ca in the shell. The regression equation is $Y = 863.6375 + 6.3297x_1 + 4.5499x_2 + 0.1813x_3 - 566.6766x_4 + 0.4323x_5 - 0.0013x_6$. CFTRI

63

Egg production at different temperatures. [Lecture]

Haugen, A. E.

Publication, European Association for Animal Production No. 19, 303-307 (1976) [En] [Dep. of Poultry & Fur Anim. Sci., Agric. Univ. of Norway, N-1432, As-NLH, Norway]

2 groups, each comprising 1260 Leghorn hens, were used in a study on effects of housing temp., (i) 10°, (ii) 16°, (iii) 22° or (iv) 28° C, on egg yield and quality. Mean sp. gr. of eggs laid by hens held at (i), (ii), (iii) or (iv) were, resp., 1.084, 1.082, 1.080, and 1.079; the overall mean was 1.081. Corresponding values for Haugh score were, resp. 76.3, 76.0, 75.5 and 74.4, the overall mean being 75.5. [See FSTA (1979) 11 5S819.] AJDW

64

Preliminary studies on egg quality under Shambat conditions.

El-Jack, M. H.; Salim, A. M. E.

Sudan Journal of Food Science and Technology 7,

62-65 (1975) [5 ref. En] [Fac. of Agric., Shambat, Sudan]

Egg wt., shape, shell wt. and albumen quality of 3 breeds, (Fayoumi, White Leghorn, and a Fayoumi/New Hampshire cross) commonly used in the Sudan, were determined. Investigations were carried out into the deterioration in egg quality during a storage period of 9 days under 2 storage environments: temp. 2-3° C and RH of 75%; and temp. of 32° C and an average RH of 39%. It was concluded that different breeds produce eggs with different wt., albumen and shell qualities; egg quality deteriorates during storage; high storage temp. is detrimental to egg quality; and non-fertilized eggs store better than fertilized eggs. VJG

65

Effect of age of the laying hen on the composition of the egg.

Anderson, G. B.; Bolton, W.; Jones, R. M.; Draper, M. H. *British Poultry Science* 19 (6) 741-745 (1978) [5 ref. En] [Poultry Res. Cent., King's Buildings, W. Mains Road, Edinburgh EH9 3JS, UK]

All eggs laid by a group of 16 light-body-wt. hens during the laying year were weighed and divided into yolk, albumen and shell and the wet and dry wt. of the components determined. There was a rapid increase in egg wt. up to about 16 wk in lay, followed by a slower increase. Similar patterns were seen in the wt. of wet yolk and wt. of albumen. Graphs for dry egg and dry yolk wt. were similar to those for wet wt. Dry albumen and dry shell wt. increased for about 8 wk, thereafter dry albumen remained almost constant whereas for dry shell there was a gradual, but small, decrease. Water, albumen and shell (expressed as a % of egg wt.) remained almost constant whereas yolk showed an increase. Protein and fat contents, as % dry wt., of the yolks and albumens from the series of eggs laid by 1 hen were found not to vary with age. VJG

66

Effect of egg weight on the weights of its components.

Ajjam, I. K.; Gharaib, F. H.; Taha, T. J.; Sial, M. B. *Agriculture Pakistan* 28 (1) 87-90 (1977) [11 ref. En] [Dep. of Anim. Production, Coll. of Agric., Univ. of Basrah, Basrah, Iraq]

Eggs from Shaver pullets were graded as peevee (PV), small (SL), medium (M) and large (L). Egg components of random samples from each grade were measured and results (average) for PV, SL, M and L resp., were: total wt., 40, 45.96, 50.86 and 58.33 g; wt. of yolk, 9.75, 11.12, 11.72 and 13.66 g; % yolk wt., 24.37, 24.20, 23.04 and 23.42; shell wt., 5.4, 5.46, 6.08 and 5.98 g; % shell wt., 13.28, 11.90, 11.89 and 10.19; albumen wt., 24.85, 29.38, 33.06 and 38.69 g; % wt. albumen, 62.13, 63.96, 65.04 and 66.34; and sp. gr. 1.010, 1.021, 1.024 and 1.066. It was concluded that the albumen increased to a highly significant level but the yolk decreased as the wt. of egg increased from 40 to 66.34 g. SP

67

A search for 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) in an environment exposed annually to 2,4,5-trichlorophenoxyacetic acid ester (2,4,5-T) herbicides.

Shadoff, L. A.; Hummel, R. A.; Lamparski, L.; Davidson, J. H.

Bulletin of Environmental Contamination and Toxicology 18 (4) 478-485 (1977) [11 ref. En] [Agric. Dep., Dow Chemical, Midland, Michigan, USA]

As part of a broad study to determine whether 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) is accumulating in the environment due to approved uses of 2,4,5-trichlorophenoxyacetic acid (2,4,5-T) based herbicides, samples of fish (catfish, Arkansas bass and walleyed pike), water, mud and human milk were collected from areas in Arkansas and Texas where 2,4,5-T herbicides are used and were analysed for TCDD. The samples were analysed by GC-MS after extensive cleanup involving alkaline digestion, H₂SO₄ treatment and chromatography on silica gel and alumina. No TCDD was detected by GC-MS procedure with average detection limits (parts/trillion) per Texas samples of: cod fish, 7; walleyed pike, 5; water, 0.1; and human milk, 3; and for Arkansas samples: bass, 7.2; catfish viscera, 10; catfish eggs, 6; and water 0.2. VJG

68

Voluntary food restriction by laying hens mediated through dietary self-selection.

Leeson, S.; Summers, J. D.

British Poultry Science 19 (4) 417-424 (1978) [20 ref. En] [Dep. of Anim. & Poultry Sci., Univ. of Guelph, Guelph, Ontario, Canada]

Individually caged Single Comb White Leghorn hens simultaneously received 2 diets which allowed selection of certain nutrients: these "split-diets", essentially provided concentrated sources of either protein and energy (191 g crude protein (CP), 12.82 MJ metabolizable energy (ME) and 4.7 g Ca/kg diet), or calcium (107 g CP, 7.28 MJ ME and 131 g Ca/kg). During four, 28 day periods of lay, birds offered these split diets consumed some 7% less food in total than did control birds receiving a conventional diet ad lib. Calculation of nutrient intakes showed that birds on the split-diets consumed significantly less protein, energy and calcium than the control birds. Giving split-diets also resulted in superior shell quality as measured by shell deformation; treatment differences were also noted in the timing of oviposition. It is suggested that the voluntary reduction in food intake noted for birds offered split-diets is associated with an appetite for calcium. Birds fed on split-diets ad lib. exhibited the greatest quantity of carcass protein and smallest quantity of carcass fat (P < 0.05). AS

69

Chlorinated hydrocarbon insecticides and nutrition. [Review]

Varela, G.; Andujar, M. M.; Navarro, M. P.

World Review of Nutrition and Dietetics 30, 148-188 (1978) [252 ref. En] [Inst. de Nutr., CSIC, Fac. de Farmacia, Ciudad Univ., Madrid 3, Spain]

In the 1st part of this review, the current situation of food contamination by organochlorine pesticides is considered, with special emphasis on accumulations in animal tissues, milk and eggs. The 2nd part deals with interactions between nutrients and pesticides. Factors (such as protein deficiency) affecting the toxicity of

chlorinated hydrocarbon insecticides, and the effects of pesticide residues on food intake and utilization and on egg production are also discussed. MEG

70

Effects of lignosulphonates on poultry when used as a binder in compounded feed.

Kivimäe, A.

Archiv für Geflügelkunde 42 (6) 238-245 (1978) [12 ref. En, de, fr, ru] [Swedish Univ. of Agric. Sci., Uppsala, Sweden]

Approx. 1300 Ross broilers were used in a study on effects of 3 lignosulphonate binders (Wafolin fermented, Wafolin unfermented, Wafolin Am), fed at levels of 0, 1.5, 3.0 or 4.5% in the diet, on performance and carcass quality. No significant effect on slaughter yield or carcass grade of the broilers was observed. In a further study, effects of diets with 0, 2, 4 or 6% Wafolin on the laying performance and egg quality of Shaver Starcross 288 hens are studied. Egg sp. gr. tended to be higher in the groups fed Wafolin than in the control group; no significant differences in Haugh score, smell, colour or taste of the eggs were observed. AJDW

71

[Amino acid composition of vermicelli made with bulk egg or dried skim-milk.]

Gordienko, A. S.

Tovarovedenie 11, 30-31 (1978) [3 ref. Ru]

Vermicelli was made in the normal manner (control) and with 10% bulk egg or dried skim-milk. Total protein in the finished products was 12.9, 13.7 and 15.0%, resp., and total essential amino acid contents were 4.10, 4.55 and 5.27%, resp. Contents of individual essential amino acids are tabulated; in all cases, the samples with skim-milk gave the highest values, followed by those with bulk egg. KME

72

Oxidised lipids-proteins browning reaction. III.

Reactions in models simulating fatty foods.

El-Zeany, B. A.; Fayez, M.; El-Tarras, M.

Egyptian Journal of Pharmaceutical Sciences 17 (2) 187-194 (1976) [30 ref. En, ar] [Analytical Chem. Dep., Fac. of Pharmacy, Cairo Univ., Cairo, Egypt]

Olive, cottonseed and linseed oils, methyl esters of cottonseed and linseed oils, methyl oleate and methyl linoleate were mixed separately with egg albumin and the browning reaction was allowed to proceed at 60°C. Among vegetable oils, mixtures containing linseed oils showed the highest browning, while olive oil mixtures showed the least browning. The browning of methyl esters was higher than that of their corresponding oils. The browning of vegetable oils mixed with proteins was less than that expected from their fatty acid composition. This lower degree of browning was attributed to the presence of natural inhibitors of fat oxidation in the unsaponifiable fraction. AS

73

Effects of battery cage shape and dietary energy regulation on the performance of laying hens offered diets containing dried poultry manure.

Lee, D. J. W.; Bolton, W.; Dewar, W. A.

British Poultry Science 19 (5) 607-622 (1978) [16 ref. En] [ARC Poultry Res. Cent., King's Buildings, West Mains Road, Edinburgh EH9 3JS, UK]

Hens housed in shallow cages produced fewer broken eggs than those housed in deep cages. Incidence of cracked eggs from hens in the 2 cage shapes was not significantly different. The number of soft-shelled eggs from hens housed in the shallow cages were greater between 18 and 74 wk of age. The incidence of soft-shelled eggs was similar for all dietary treatments. Effects of cage shape and dietary treatments on the shell and albumen quality were investigated. There were no significant effects of cage shape on shell wt., shell thickness or albumen quality. The yolk colour of eggs from hens housed in shallow cages was slightly paler ($P < 0.05$) but the difference is probably not commercially significant. Yolk colour was significantly affected by diet, the hens fed on the dried poultry manure-containing diets producing eggs with darker yolks than those fed on the control diet. VJG

74

Bacterial repressive action of meat starter cultures in liquid whole egg.

Raccach, M.; Baker, R. C.

Journal of Food Science 44 (1) 90-92 (1979) [18 ref. En] [Poultry Sci. Dep., Cornell Univ., Ithaca, New York 14853, USA]

Pediococcus cerevisiae inoculated in pasteurized liquid whole egg (PLWE) (3°C, pH 7.4) had a larger repressive action than *Lactobacillus plantarum* toward *Pseudomonas fluorescens* (2.8 and 1.6 log cycles resp.) but both had the same repressive action against *Pseudomonas fragi* and *Pseudomonas putrefaciens*. The 50:50 mixture of the starter cultures had a repressive action similar to the *pediococci* against *Pseudomonas fluorescens* but was more effective against *Pseudomonas putrefaciens* than against *Pseudomonas fragi* (2.5 and 1.6 log cycles resp.). At pH 6.8 both starter cultures and their mixture had a larger repressive action toward the 3 spp. of *Pseudomonas*. *Salmonella typhimurium* at 11°C, pH 7.4 was not repressed by the starter cultures. At pH 6.8 the repressive action of only the *pediococci* and the mixture increased (1.0-2.0 log cycles). A further decrease of the pH of the PLWE to 6.2 did not change the repressive action of the starter cultures against the pathogen. IFT

75

Studies on some egg-quality traits of desi and exotic chicken and their crosses.

Jain, L. S.; Menawat, S. N.; Sharma, V. V.; Bhatnagar, M. S.

Indian Journal of Animal Sciences 48 (9) 678-682 (1978) [7 ref. En] [Univ. of Udaipur, Udaipur 313 001, India]

Studies were conducted on the quality of eggs laid by Desi, White Leghorn, and Rhode Island Red hens and their 2- and 3-breed crosses. Tables of data are given for egg wt., Haugh unit score, yolk wt., albumen wt., albumen height, dry shell wt., shell thickness, and % yolk, % albumen and % shell. Correlations of egg wt. and Haugh unit scores with other quality characteristics are also presented. The relative merits of the eggs laid by the various purebred and crossbred groups are discussed in detail. Egg wt. was positively correlated with yolk wt., albumen wt. and shell wt. in most groups; egg wt. was not closely correlated with albumen height or Haugh unit score. Albumen height was generally significantly correlated with Haugh unit score. AJDW

76

Egg washing – a review. [Review]
Moats, W. A.

Journal of Food Protection 41 (11) 919–925 (1978) [93 ref. En] [Anim. Products Marketing Lab., Agric. Marketing Res. Inst., SEA, USDA, Beltsville, Maryland 20705, USA]

Cleaning eggs by washing was in the past widely condemned but is now a common practice and required in plants operating under Federal Grading Service. Washing commonly resulted in increased spoilage losses during long term storage. Washing practices that promoted spoilage included using: wash water colder than the eggs, wash water with high bacterial counts, wash water containing appreciable soluble Fe, and washing machines with surfaces contaminated by bacteria. Occasionally, spoilage losses were substantial during long term storage even though apparently satisfactory washing practices were followed. Treatment with sanitizing chemicals did not destroy bacteria embedded in shells. Long term storage life is of little concern with present day marketing practices since few eggs are stored for extended periods. However, Fe in wash water may accelerate spoilage. Washing, besides improving appearance of eggs, was effective in removing surface dirt and bacteria which would otherwise have contaminated egg meats when eggs were broken out. AS

77

Genetic and seasonal effects on the exterior egg quality in Alexandria cross lines, Fayoumi and Dokki-4 chickens.

Khalifah, M. A.; Shawer, M. F.; Kosba, M. A.; Khalil, A. A.

Beiträge zur Tropischen Landwirtschaft und Veterinärmedizin 16 (3) 321–328 (1978) [24 ref. En, de, ru, fr, es] [Univ., El-Mansoura, Egypt]

3316 eggs from 3 Alexandria cross lines, Dokki-4 and Fayoumi populations were examined for egg wt., shape index (width:length) and shell thickness, and results were subjected to statistical analysis. Means and s.e. for 5 populations and 4 seasons are tabulated, giving the following totals: egg wt. 49.11 g \pm 0.10 g, egg shape index 0.747, shell thickness 0.291 mm. There were significant seasonal differences and significant season \times population interactions for all 3 features. RM

78

[The alkane yeast VITON in poultry feed.] Alkanhefe VITON im Geflügelfutter.

Vogt, H.; Krieg, R.; Harnisch, S.

Archiv für Geflügelkunde 42 (5) 201–207 (1978) [3 ref. De, en, fr, ru] [Inst. für Kleintierzucht, Bundesforschungsanstalt für Landwirtschaft, Braunschweig-Völkenrode, Celle, Federal Republic of Germany]

Feeding trials with Japanese 'VITON' feed yeast (*Candida paraffinica* cultured on purified n-paraffins) are described. A 308-day trial with laying hens was conducted, using diets containing 0, 3.75, 7.50, 11.25, 15.00 or 18.75% VITON. Tables of results are given for laying performance and egg quality (% cracked eggs, shell deformation under compression, shell breaking strength, shell thickness, albumen index, foam index, foam stability, yolk index, and yolk colour) of eggs at various stages through the trial. Although shell quality was not significantly influenced by dietary VITON level, there was a tendency for shell thickness to decrease with increasing dietary Viton level. Effects on albumen index and yolk index were irregular. Eggs laid by groups receiving VITON tended to have paler yolk colour and better foam stabilities than those laid by groups fed the VITON-free control diet. AJDW

79

The influence of high constant environmental temperature and energy level in the diet on the performance of the laying hen.

El-Jack, M. H.; Blum, J. C.

Archiv für Geflügelkunde 42 (6) 216–220 (1978) [24 ref. En, de, fr, ru] [Sta. de Recherches Avicoles, INRA, Nouzilly 37380, France]

144 ten-month-old laying pullets of a commercial strain were used in a study on effects of the energy level in the diet (2490 or 3100 kcal/kg diet) and environmental temp. (4 wk at 15°C, followed by 6 wk at either 15° or 37°C) on laying performance and egg quality. Tables of results are given. Egg quality (egg wt., yolk wt., albumen wt., shell wt., shell index) was poorer at 37°C than at 15°C. Dietary energy level had little effect on the egg quality, except for a tendency for pullets on the high-energy diet to lay heavier eggs than those on the lower-energy diet. AJDW

80

[Effect of egg storage conditions on changes in electrophoretic patterns of proteins.]

Trziszka, T.; Smolinska, T.

Przemysł Spożywczy 32 (6) 225–227 (1978) [17 ref. Pl, ru, en, fr, de] [Zakład Tech. Surowców Zwierzęcych, Inst. Przechowalnictwa i Tech. Żywności, AR, Wrocław, Poland]

(i) 80 Leghorn eggs (wt. 55–60 g) collected over 4 days in a small poultry farm with 60 layers, and (ii) 80 such eggs from a large commercial farm with 3000 layers were stored for ≤ 60 days at $20 \pm 2^\circ\text{C}$ and $72 \pm 3\%$ RH, and 10-egg (i) and (ii) samples were examined initially (a few h after laying) and after storage for 10, 20, 30, 40, 50 and 60 days. Individual 0.2 ml egg white samples were fractionated by

polyacrylamide gel electrophoresis; egg freshness was assessed in terms of Haugh units until the 50th day. It is concluded from electropherograms presented that 12 protein fractions were present initially; that globulin fractions began to disappear progressively after 30 days; and that changes on ovomucoid, ovalbumin and conalbumin fractions became noticeable at 50–60 days; no difference was found in these respects between (i) and (ii). However, tabulated data on freshness assessment show significantly ($P < 0.05$) better freshness of (i) eggs after storage for 30 and 40 days. SKK

81

Sampling, preparation and chemical analysis of meat and meat products and of eggs and egg products suspected of containing aflatoxin residues. [Review] Löttsch, R.

Fleischwirtschaft 58 (4) 594–598 (1978) [En]
[Bundesanstalt für Fleischforschung, 8650 Kulmbach, Federal Republic of Germany]
See FSTA (1978) 10 9G545.

82

[Proper handling of veterinary drugs and withdrawal time.]

Milhaud, G.

Recueil de Medecine Veterinaire 154 (2) 177–185 (1978) [8 ref. Fr, en, es] [Dep. de Pharmacie & Toxicology, Ecole Nat. Vet. d'Alfort, 94701 Maisons-Alfort, France]

Withdrawal time is defined as the time necessary between administration of a veterinary preparation and use of an animal product (milk, eggs, meat) for human food to ensure the absence of residues dangerous to human health. Present legislation in France is discussed together with the need for control measures and means of enforcement. 2 different concepts are involved, i.e. (i) complete absence of any detectable residue in the food product, or (ii) absence of a toxic level of residue. Analytical methods may not be available to ensure (i), or alternatively may be so highly sensitive that the time period could be weeks or months; detailed knowledge is required of the metabolism of the product and possible accumulation of small doses, especially carcinogens. (ii) requires accurate knowledge of the toxicity level (below this a product may be harmless and sometimes beneficial), medium term effects (3–6 months), long-term effects for possible carcinogens, effects on reproduction and resistance to antibiotics; calculation of acceptable daily intake and thence tolerance levels for various foods is essential. French regulations specify withdrawal times for 5 antibiotics, 7 hormone preparations, 11 anti-parasite preparations, and 2 mineral elements, with 'no tolerance' where information is incomplete. Examples are given for widely used antibiotics, including times before consumption of milk, slaughter of meat animals, and sale of eggs. ELC

83

[Residues of synthetic antibacterials in livestock products. I. Analytical method for 3,5-dinitro-o-toluamide (zoalene) by gas chromatography.]

Nose, N.; Hoshino, Y.; Kikuchi, Y.; Yamada, F.; Watanabe, A.

Journal of the Food Hygienic Society of Japan

[*Shokuhin Eiseigaku Zasshi*] 19 (3) 323–328 (1978)

[7 ref. Ja, en] [Saitama Inst. Public Health, Kamiookubo, Urawa, Japan]

An extraction technique and a method of detn. of zoalene (3,5-dinitro-o-toluamide) residues contained in chicken meat and eggs were developed. The detection limit of zoalene in the samples was 0.03 ng. TM

84

Palm oil mill waste as animal feed – processing and utilization. (In 'International developments in palm oil' [see FSTA (1979) 11 7N295].) [Lecture]

Webb, B. H.; Hutagalung, R. I.; Cheam, S. T.
pp. 125–145 (1977) [12 ref. En] [Fac. of Agric., Univ. of Malaya, Kuala Lumpur, Malaysia]

Palm oil mill wastes represent a potential 4 million t liquid effluent problem and 50% of the available heat energy is not being utilized. The liquid waste can be converted into a valuable animal feed which would substitute at least maize. The Censor system using cassava meal and palm kernel meal as absorbents for the waste sludge can produce an acceptable animal feed with a potential market value of M\$230/ton. The recommended process could potentially return > 50% on capital/yr. Censor utilizes waste heat to reduce process costs and eliminates the pollution problem, completely utilizing all waste materials. Fermentation by an anaerobic process could improve utilization of materials, improve end product quality and reduce input costs. Results of feeding trials demonstrated that palm oil sludge recovered by the Censor process could be used as animal feed. Performance and carcass characteristics of pigs and poultry and the egg quality of laying hens fed Censor-supplemented diets compared favourably with those fed conventional diets. AS

85

[Problems in evaluation of drug residues in hens' eggs.] Problematik der Bewertung von Wirkstoff- und Arzneimittelrückständen in Hühnereiern.

Löliger, H.-C.

Archiv für Lebensmittelhygiene 29 (6) 228–234 (1978)

[many ref. De, en] [Bundesforschungsanstalt für Landwirtschaft, Braunschweig-Völkenrode, 3100 Celle, Federal Republic of Germany]

Using published data and calculations of the max. expected drug residues in eggs after medication of laying hens, 3 groups of drugs are proposed: drugs leaving no residues, or concn. < 0.01% of the lowest daily therapeutic oral dose for infants (penicillin, the aminoglycoside antibiotics, tetracyclines, erythromycin, tylosin, piperazine citrate, thiabendazole, mebendazole and ethopabate); drugs resulting in max. residues of 0.05% of the lowest daily oral dose for infants (furazolidone, arsanilic acid and the majority of

coccidiostatic and antihelmintic drugs); and drugs resulting in residues of the order of 0.1%. The lowest daily oral dose for infants (sulphonamides, pyrimethamine and chloramphenicol). Taking account of the waiting time between the end of medication and marketing of eggs and the breakdown during cooking, the health hazards from drug residues appear to be negligible. RM

86

Egg breaking apparatus.

Willsey, C. H.

United States Patent 4 111 111 (1978) [En]

A machine is described for breaking egg shells and separating the contents, which comprises a separating assembly adapted to be positioned to receive the contents of the egg and for separating the white from the yolk. IFT

87

A review of the 'toxic' effects of rapeseed meals with observations on meal from improved varieties.

Hill, R.

British Veterinary Journal 135 (1) 3-16 (1979) [54 ref. En] [Royal Vet. Coll., Boltons Park, Potters Bar, Herts., UK]

This review on the toxicity of dietary rapeseed meal to various domestic animals includes data for the occurrence of 'fishy' or 'crab-like' taints in eggs laid by hens fed rapeseed meal; it appears likely that the taint is attributable to inhibition of hepatic trimethylamine oxidase in the hens by an unidentified constituent of rapeseed. AJDW

88

[Effect of birds' housing conditions on retail egg quality.]

Rudavskaya, A. B.; Shkarupa, V. F.

Tovarovedenie 11, 46-49 (1978) [3 ref. Ru]

Katman-63 hens, of the same age and on the same diet, were housed either in 4-storey, mechanized cages (KBN-1) or in single-storey cages (OBN-1). 150 eggs were taken daily from each battery, and analysed for pH, wt., white:yolk:shell ratio, shell strength, thickness of shell and contiguous membranes, white:yolk ratio, titratable acidity, moisture, protein, ash, yolk lipids, lecithin, cholesterol, fatty acids, carotene, carotenoids and vitamins A, D, E, B, and B₂. Results (tabulated) showed that the single-storey cages are to be recommended from the viewpoints of improved quality and increased wt. of eggs, even though no differences were found in sensory evaluation. KME

89

[Effect of ozonization on the quality and keeping characteristics of retail eggs.]

Rudavskaya, A. B.; Tishchenko, E. V.

Tovarovedenie 11, 43-46 (1978) [Ru]

Hens' eggs (Leghorn breed) were treated with ozone (10-12 mg O₃/m³ air) for 6 h, and then stored for 6 months at -1 ± 1°C, 86 ± 2% RH or 19 ± 1°C, 75 ± 2% RH; untreated eggs acted as controls. At various intervals, the eggs were analysed for general

sensory quality, changes in the lipid fractions of the yolk (acid, peroxide and thiobarbituric acid values), white and yolk indices (not defined), and variations in quality grading. Results (tabulated) showed that in all cases these parameters had better values in the O₃-treated samples than in the controls, and that the lower storage temp. had a further beneficial effect. KME

90

[Bacterial counts and identification in eggs.]

Lopez de Herrera, A. I.; Manrique, L. G.

Revista Instituto Colombiano Agropecuario 12 (4) 489-503 (1977) [22 ref. Es, en] [LIMV-ICA, Apartado Aereo 29743, Bogota, Colombia]

72 dozen eggs from Bogota supermarkets were examined for bacterial contamination after 1-30 days storage at room temp. Studies were performed separately on shells, whites and yolks. Tables and histograms of the results showed total counts of 5.2×10^6 /g, 1.4×10^3 /g and 6.8×10^4 /g resp.; coliform counts were 1.6×10^3 /g, 13/g and 69/g resp. 29% of eggs were free of any internal contamination, 62.5% were contaminated with coliforms (mainly the shells). Counts were increased 2-5 fold by raising the temp. from 7° to 20-37°C. The effects of washing the eggs on internal contamination could not be determined. The organisms isolated were *Staphylococcus epidermidis*, *Micrococcus* sp., *Streptococcus faecalis* and other sp., *Bacillus cereus*, *Pseudomonas aeruginosa*, *Escherichia coli*, *Proteus vulgaris*, *Klebsiella* spp. and *Enterobacter* spp. RM

91

Fluoride content in eggs of wild birds (*Parus major* L. and *Strix aluco* L.) and the common house-hen (*Gallus domesticus*).

Toledo, B. van

Fluoride 11 (4) 198-207 (1978) [35 ref. En] [Inst. de Biol. Anim., Univ. de Fribourg, 1700 Fribourg, Switzerland]

Eggs of *Gallus domesticus* gathered from (i) a non-polluted area and (ii) an industrially contaminated area, were analysed for F⁻ concn., and showed the following (mean) F⁻ concn. resp.: albumen + yolk 3.8 ± 1.26 , and 13.6 ± 2.55 p.p.m., and shells 4.94 ± 0.99 and 120 ± 2.48 p.p.m. SP

92

Commercial stocks for broiler production: body weights, feed conversion efficiency, carcass yield, mortality, rate of lay and egg quality traits of three commercial broiler stocks.

Chhikara, B. S.; Singh, R. P.; Sharma, R. K.; Kumar, J.; Balaine, D. S.

Haryana Agricultural University Journal of Research 8 (3) 216-222 (1978) [21 ref. En] [Dep. of Anim. Breeding, Haryana Agric. Univ., Hissar, India]

Studies were conducted on performance and carcass yield of broiler of 3 commercial stocks, (i), (ii) and (iii), slaughtered at 10 wk of age; values for % carcass yield (means of 10 birds) were (i) 72.95, (ii) 73.86 and (iii) 73.86. Further studies were conducted on the laying performance and egg quality of hens of these 3 broiler stocks. Mean values for egg quality traits (for 96 (i), 123 (ii) and 120 (iii) hens, resp.) were: egg wt. 65.33, 62.00 and 64.43 g; shape index 72.31, 74.27 and 74.23; Haugh unit

score 86.56, 87.73 and 89.70; yolk index 47.54, 46.87 and 48.55; shell thickness 0.362, 0.365 and 0.342 mm; yolk colour 13.22, 12.30 and 11.60; blood spot incidence 26.66, 6.66 and 23.33%; and meat spot incidence 20.00, 50.00 and 40.00%. AJDW

93

[Eggs. Quality requirements.]

Hungary, Magyar Szabvanyugyi Hivatal

Hungarian Standard MSZ 6824-77, 7pp. (1977) [Hu]

94

[Contents of polychlorinated biphenyls (PCB) in some foods of animal origin.]

Cwierniewska, E.

Roczniki Panstwowego Zakladu Higieny 29 (5) 483-489 (1978) [23 ref. Pl, ru, en] [Zaklad Badania Zyznosci i Przedmiotow Uzytku, PZH, Warsaw, Poland]

GLC detn. of PCB in 30 samples of sea fish, 14 samples of dried milk, 21 samples of liquid milk and 12 samples of eggs showed their presence in only 8 samples of eggs at 0.0543-0.999 (mean, 0.287) mg/kg egg mass. Recovery of PCB added as Aroclor compound at 1 mg/kg was 73% from fish muscle (range, 60-88%), 73.5% from milk and 93.6% from eggs. SKK

95

The consumers view. [Lecture]

Grose, D. H.

IFST Proceedings 11 (3) 141-143 (1978) [En]

Food storage and distribution is briefly discussed from the viewpoint of the UK Consumers' Association. Particular problems mentioned include excessively high metal contents in canned fruit, and deterioration of fresh eggs, both due to inappropriately long storage, and high temp. in frozen display cabinets. It is concluded that more information on shelf-life and storage instructions should be communicated to the distributor, retailer and consumer, and that codes of practice for food distribution should be established. [See FSTA (1979) 11 8G638.] DIH

96

[Packaging appliance for transport of eggs and their presentation at the point of sale.]

Societe Midi Plast SA

French Patent Application 2 383 081 (1978) [Fr]

Positioning, stabilizing and protection of eggs are provided by plastics boxes (lid and base) shaped to take 6 eggs in nests of truncated prism form, each provided with 2 rings which carry a piece of plastics film serving as shock absorber and positioning agent. W&Co

97

The eggburger.

Anon.

Food Engineering International 3 (11) 22 (1978) [En]

A disc-shaped egg product weighing 1/4 lb and frozen is ready for heating by the consumer and serving in a hamburger bun, or with garnishes. The product is made from low-cholesterol egg substitute (Fleischmann's Egg Beaters, 67.5%), vegetable shortening (27.5%), salt

(3.75%) and leavening agent (1.25%). Emulsification parameters are critical for product formation. DIH

98

Baking characteristics and protein quality of soy-whole egg, soy-egg yolk and soy-egg white supplemented breads.

O'Connor, M. P.; Erdman, J. W., Jr.; Nelson, A. I.

Journal of Food Science 44 (3) 839-842 (1979) [En]

[Dep. of Food Sci., 567 Bevier Hall, Univ. of Illinois, Urbana, Illinois 61801, USA]

Full-fat soy (S), and other full-fat soy-whole egg (SE), soy-egg yolk (SEY) and soy-egg white (SEW) flours were produced and utilized as 12% supplements for patent wheat flour in breads. Addition of 0.5% sodium stearoyl-2-lactylate (SSL) improved loaf vol. of all bread types except SEY. Generally, 30 or 45 p.p.m. bromate supplementation also resulted in increased loaf vol. Organoleptic evaluations of bread types indicate that 100% wheat flour and SEY supplemented loaves scored well in most quality characteristics. Protein efficiency ratio analyses showed that all S and soy-egg fortified breads produced better growth than 100% wheat flour bread. Supplementation of breads with SEY flour produces breads of good quality without the need for SSL or bromate. IFT

99

The effect of egg size on the relative percentages of thick, inner thin and outer thin albumen.

Heath, J. L.

Poultry Science 57 (1) 312-313 (1978) [6 ref. En] [Dep. of Poultry Sci., Univ. of Maryland, College Park, Maryland 20742, USA]

The size of fresh eggs influenced the proportion of thick and inner thin albumen. The relative amount of outer thin albumen was not affected. As egg size increased, the relative amount of thick albumen increased at the expense of inner thin albumen. AS

100

Effect of storage on lipid composition and functional properties of dried egg products.

Lieu, E.-H.; Froning, G. W.; Dam, R.

Poultry Science 57 (4) 912-923 (1978) [22 ref. En]

[Anim. Sci. Dep., Univ. of Nebraska, Lincoln, Nebraska 68583, USA]

Changes in functional properties and lipid composition of whole egg solids, egg yolk solids, and free flowing egg yolk solids stored at 1.7°, 12.8°, 23.9° or 35°C for 3-6 months were examined. In general, storage of dried egg products at 23.9°C for 6 months or 35°C for ≥ 3 months resulted in a decrease of pH, emulsion stability (mayonnaise test), and cephalin content. Viscosity of rehydrated egg products increased markedly at higher storage temp. Browning of egg products, as measured by Gardner values, was observed under high storage temp. No changes in total lipid content, lecithin content, or fatty acid composition were observed in this study. AS

101

[Method for preserving eggs.] Verfahren zum Haltbarmachen von Eiern.

Pilters, H.

German Federal Republic Patent Application

2 726 983 (1978) [De]

Raw or boiled eggs are enclosed in airtight pockets, from which the air is evacuated. In the process, the pockets are formed in a sheet of plastics film, the eggs are placed in the cavities, another similarly shaped film layer is superimposed, the 2 films are sealed together, and the air is evacuated from the cavities. W&Co

102

Dietary gums and fishy odours in eggs.

Leeson, S.; Summers, J. D.

Poultry Science 57 (1) 314-315 (1978) [6 ref. En] [Dep. of Anim. & Poultry Sci., Univ. of Guelph, Guelph, Ontario, Canada]

Rhode Island Red (RIR) hens receiving diets containing 15% rapeseed meal produced eggs having fishy odours. This effect was accentuated when rapeseed meal contained 1.5% of rapeseed gums. Fishy odours were also detected in eggs produced by hens fed diets containing soybean meal + 1.5% soybean gums. It is suggested that the high choline content of both rapeseed and soybean gums may be a contributing factor in the occurrence of fishy odours in eggs from RIR hens. AS

103

The effect of dietary monoterpenes on the cholesterol level of eggs.

Hood, R. L.; Bailey, W. M.; Svoronos, D.

Poultry Science 57 (1) 304-306 (1978) [11 ref. En] [CSIRO Div. of Food Res., PO Box 52, N. Ryde, NSW, Australia]

Monoterpenes were included in the diets of laying hens in an attempt to inhibit the synthesis of cholesterol and hence reduce its amount in egg yolk. However, feeding 5 monoterpenes, phorone or 200 mg cholesterol/day to hens did not significantly change the level of cholesterol in the egg yolk. These compounds did not cause signs of ill health in the hen or a decline in egg production. AS

104

Brewers' dried grains in laying mash.

White, W. B.; Sunde, M. L.; Bird, H. R.; Burger, W. C.; Prentice, N.

Feedstuffs 51 (8) 27-28 (1979) [10 ref. En] [Poultry Sci. Dep., Coll. of Agric. & Life Sci., Univ. of Wisconsin, Madison, Wisconsin 53706, USA]

Groups of DeKalb and Hisex pullets (initially 20 wk of age) were used in an 11-month feeding trial to evaluate effects of diets containing 0, 10, 25 or 40% dried brewers' grains on laying performance and egg quality (Haugh score). Some of the birds fed the diet with 40% dried brewers grains received lysine supplements, for the first 3 months, some for the 4th-11th months. Tables of results are given. The results show no significant difference in Haugh score between eggs laid by the hens receiving 0, 10 or 25% brewers' grains. Eggs laid by hens fed the 40% brewers' grains diet had higher Haugh scores than the other groups;

they also had lower egg production and shorter clutches. The relatively high Haugh score of the first egg in a clutch may thus be largely responsible for the apparent increase in Haugh score at this dietary brewers' grains level. Lysine supplementation of the diet did not significantly influence Haugh scores. AJDW

105

[New technique for storing egg products.]

Bonduelle, M.

Industries Alimentaires et Agricoles 95 (9/10) 1043-1048 (1978) [Fr, en]

A process developed and patented by Etablissements Liot for producing liquid conc. whole egg, egg whites or egg yolk is described, with the aid of a diagram. Marketed under the trade name Confidoeuf, the product is bacteriologically and technologically stable and easy to use. Sweet and salty products are available for specific uses. The total bacterial count in whole eggs is reduced from an initial value of 420 000-950 000/g to 30-500/g after processing and holding for 15 days at 20°C. The shelf-life is several months at room temp., rising to ≥ 8 months under special conditions, without detriment to its whipping, coagulation and emulsifying properties. RM

106

[Vitamin A in irradiated foods.] Vitamin A in bestrahlten Lebensmitteln.

Diehl, J.-F.

Zeitschrift für Lebensmittel-Untersuchung und -Forschung 168 (1) 29-31 (1979) [12 ref. De, en]

[Bundesforschungsanstalt für Ernährung, Engesserstrasse 20, D-7500 Karlsruhe 1, Federal Republic of Germany]

Vitamin A losses induced by 10 MeV electrons in cream cheese [60% fat in DM], calf liver sausage, pig liver, whole egg powder and margarine continued to increase during storage for 4-8 wk in presence of air. Thus, vitamin A loss in sausage irradiated with 5 Mrad was 22% on the day after irradiation, and 61% after 4 wk. Irradiation and storage at 0°C instead of at ambient temp. reduced these losses considerably. Exclusion of air (vacuum, N₂) or irradiation on solid CO₂ (approx. -80°C) was even more effective in preventing destruction of vitamin A. After 4 wk of storage, cream cheese irradiated at 5 Mrad had lost 60% vitamin A when irradiated and stored in air at ambient temp., 20% in N₂ atm, 5% in vacuum package, and 5% when irradiated on solid CO₂ and stored at ambient temp. AS

107

[Fungal contamination of foods, with special reference to bakery products.] [Lecture]

Angeli, A. degli

Tecnica Molitoria 30 (2) 119-124 (1979) [It]

Aspects considered in this discussion of contamination of bakery products with toxigenic and other fungi include: contamination by way of raw materials (flour, fats, eggs, sugar, sultanas); contamination by packaging materials; contamination

by spores present in the air or on equipment; contamination transmitted by humans or pests; and methods for minimization of fungal contamination of, and fungal growth in or on, bakery products. [See FSTA (1979) 11 9C476.] AJDW

108

Eggs - an asset on the menu.

Anon.

Catering and Hotel Management 51 (3) 8-9 (1979) [En]

The catering usage of shell eggs is discussed, with regard to the versatility of eggs (on their own, as part of a meal or as ingredients in a prepared dish). Buying for quality and storage of eggs are also briefly described. SP

109

Survival of Salmonella during cooking of eggs.

Stiles, M. E.

Journal of the Canadian Dietetic Association 40 (2) 155-158 (1979) [22 ref. En] [Foods & Nutr., Fac. of Home Economics, Univ. of Alberta, Edmonton, Alberta, Canada T6G 2M8]

Some hospitals have recommended the hard cooking of eggs for patients to reduce the chances of Salmonella infections from eggs. Newly laid eggs were surface contaminated with *S. typhimurium* and stored at 10°C and 79% RH. Eggs were also contaminated internally, in the albumen or yolk, and cooked in a boiling water bath. Results indicated that hard cooking of eggs might be an extreme precaution, that could be avoided if appropriate control of egg supplies is exercised by dietary staff. AS

110

A note on the inheritance of some egg-quality traits in White Leghorn.

Jain, R. S.; Banerjee, A. K.; Chaudhary, R. P.

Indian Journal of Animal Sciences 48 (12) 920-922 (1978) [13 ref. En] [Govind Ballabh Pant Univ. of Agric. & Tech., Pantnagar 263 145, India]

This paper includes mean values, heritabilities and repeatabilities for the wt., shell thickness, shape index, yolk index, albumen index, yolk factor and Haugh unit score of eggs laid by White Leghorn hens. Genetic, phenotypic and environmental correlations between these characteristics are also given. AJDW

111

Effect of rapeseed meal on hepatic trimethylamine oxidase activity in the domestic fowl in relation to egg taint.

Pearson, A. W.; Butler, E. J.; Curtis, F.; Fenwick, G. R.; Hobson-Frohock, A.; Land, D. G.

Journal of the Science of Food and Agriculture 30 (3) 291-298 (1979) [17 ref. En] [Houghton Poultry Res. Sta., Huntingdon, Cambridgeshire PE17 2DA, UK]

Shaver Starcross 585 hens were divided into 2 groups, (i) 'tainters' and (ii) 'non-tainters', on the basis of production of eggs tainted with trimethylamine (TMA) when fed a diet containing 10% rapeseed meal (*Brassica napus*). Levels of hepatic TMA oxidase were

significantly lower ($P < 0.05$) for (i) than (ii) on control diets, were significantly depressed ($P < 0.001$) for both groups by feeding the rapeseed meal diet, and were considerably lower ($P < 0.001$) in (i) than in (ii) on this diet. Values for the apparent Michaelis constant of hepatic TMA oxidase were not significantly different between (i) and (ii) on control diets, were significantly increased by feeding rapeseed meal diets ($P < 0.001$ for (i) and $P < 0.05$ for (ii)) and were higher for (i) than (ii) ($P < 0.001$) on rapeseed meal diets. In vitro preparations of hepatic TMA oxidase were inhibited by sinapine and acetone- or methanol-extracts of rapeseed, (i) and (ii) preparations behaving similarly. A methanol extract of rapeseed meal passed over a cation exchange resin also inhibited in vitro TMA oxidase, despite its very low sinapine content. It is concluded that egg taint is a result of inherently low synthesis of TMA oxidase in (i) and of the great reduction of its activity when rapeseed meal is fed. DIH

112

The detection of the thiocyanate ion (SCN^-) in hen's egg by gas chromatography.

Ahmed Shuaib, A. C.; Beswick, G.; Tomlins, R. I.

Journal of the Science of Food and Agriculture 30 (3) 299-304 (1979) [16 ref. En] [Dep. of Applied Biol. & Food Sci., Polytech. of the South Bank, London SE1, UK]

The free thiocyanate ion (SCN^-) content of eggs from 5 different strains of hen was determined by gas chromatograph as CNBr after treating the deproteinized liquid whole egg with aqueous Br_2 solution. Interference by cyanide and residual protein after deproteinization with phosphotungstic acid was not found to have any noticeable effect on the results. Samples spiked with known concentrations of SCN^- gave recoveries of 95%. The levels of SCN^- detected ranged from 0.54 to 0.675 mg/kg. There was very little variation in the levels detected from 1 strain of hens over a period of 10 wk. The amount present presumably originating from detoxification of cyanide in the liver and kidney would be insufficient to promote bactericidal activity, when incorporated into the lactoperoxidase/thiocyanate/ H_2O_2 antimicrobial system. AS

113

Effect of fertilization and age of hen on the cholesterol content of chicken egg yolk.

Spencer, J. V.; Becker, W. A.; Mirosh, L. W.; Verstrate, J. A.

Poultry Science 57 (1) 261-264 (1978) [10 ref. En] [Dep. of Food Sci. & Tech., Washington State Univ., Pullman, Washington 99164, USA]

The cholesterol content of infertile and fertile eggs from White Leghorn hens was compared. In trials 1 and 2, infertile eggs were collected, a male was introduced, and fertile eggs then collected from the same hens. In trial 3, two pens of hens were trapnested. The first pen contained hens only, the second pen contained hens plus a male. After the desired number of eggs were collected from each hen, the male was moved to the other pen. 21 days were allowed to elapse and eggs were again collected. In trial 1, there were no

statistically significant differences between fertile and infertile eggs in wet yolk wt., dry yolk wt., mg cholesterol/g dry yolk, or total yolk cholesterol. In trial 2, fertile eggs were significantly higher than the infertile eggs in dry yolk wt. ($P < 0.05$), mg cholesterol/g dry yolk ($P < 0.05$), and total yolk cholesterol ($P < 0.01$). In trial 3, there were no statistically significant differences between fertile and infertile egg values for any of the egg traits examined. When results were analysed for differences due to age of hen, wet yolk wt., dry yolk wt. and total cholesterol were significantly higher ($P < 0.05$) for eggs laid by the 12.5 month old hens than for eggs laid by the same hens 11.0 months old. Cholesterol concn. did not change with the age of the bird. The results from this study show that fertile eggs are not lower in cholesterol content than infertile eggs. AS

114

Effect of *Mycoplasma synoviae* on egg quality and egg production of broiler breeders.

Lott, B. D.; Drott, J. H.; Vardaman, T. H.; Reece, F. N. *Poultry Science* 57 (1) 309-311 (1978) [4 ref. En] [USDA, S. Cent. Poultry Res. Lab., Mississippi 39762, USA]

An experiment was conducted to study the effect of *Mycoplasma synoviae* (MS) infection on egg shell strength, Haugh units, and egg production. Results indicate that MS infection had no effect on egg shell strength or Haugh units; however, a reduction in egg production of approx. 18% was noted 2 wk after infection. Egg production for the MS infected hens was significantly lower than that of the control 1 wk after infection and remained significantly lower until 4 wk after infection. AS

115

Some nutritional aspects of utilizing rice bran in poultry diets.

Prawirokusumo, S.

Dissertation Abstracts International, B 38 (10) 4553-4554; Order no. 78-04120, 175pp. (1978) [En] [Univ. of Illinois, Urbana, Illinois 61801, USA]

An extensive series of studies on effects of diets containing various levels of rice bran (with or without various other feed supplements) on the growth and laying performance of hens is described. The results show that neither dietary rice bran nor supplemental protein source (soybean, groundnut or fish meal, or combinations thereof) significantly influenced albumen or shell quality of eggs. Egg yolks became progressively lighter in colour as the level of rice bran in the diet increased. AJDW

116

Determination of residues of organochlorine pesticides in animal fats and eggs.

United Kingdom, Ministry of Agriculture, Fisheries & Food, Committee for Analytical Methods for Residues of Pesticides & Veterinary Products in Foodstuffs

Analyst 104 (1238) 425-433 (1979) [18 ref. En] [Plant Path. Lab., Min. of Agric., Fisheries & Food, Hatching Green, Harpenden, Herts., AL5 2BD, UK]

This is a report by the Panel on 'Determination of Organochlorine Pesticides in Foodstuffs of Animal Origin' of the Committee, whose aim was to validate by collaborative study a method for the detn. of such residues. Methods available were considered and the Telling et al. method [see FSTA (1978) 10 5C166] was studied collaboratively by 11 laboratories; standardization of the alumina column was also studied. Results obtained in the collaborative recovery experiments are given in tables. The method (details given in an appendix), which closely followed that of Telling et al., was found satisfactory for determining residues of hexachlorobenzene and β -BHC in butterfat and mutton fat, α -BHC, γ -BHC, pp'-DDT and pp'-DDE in chicken fat, β -BHC, dieldrin, hexachlorobenzene and TDE in pork fat, and the DDT series in eggs. A method is also given for extraction of fat, used in the collaborative study for eggs only but considered to be widely applicable. AL

117

Analytical methodology and the interface with animal drug approval. [Lecture]

Perez, M. K.

Journal of the Association of Official Analytical Chemists 61 (5) 1183-1191 (1978) [En] [FDA, Office of Sci., Washington, DC 20204, USA]

A 6-stage evaluation process is described, which is designed to provide data for establishing criteria for acceptability of analytical methods for drug residues in foods. The stages are as follows: accumulation of knowledge of target sp. metabolism (i.e. the food animal); accumulation of knowledge of test sp. metabolism (i.e. that fed tissues from the target sp. to relate to possible human exposure); toxicity studies and establishment of tolerances in specific foods, related to human consumption (e.g. lower tolerances in milk than in meat because of infant diets); selection of 1 appropriate target tissue to monitor all edible carcass tissues, + milk and eggs where relevant, and choice of a marker compound; development of the regulatory method; and establishment of a safe withdrawal period. [See FSTA (1979) 11 4C194.] DIH

118

Drug residues in animal tissues and their regulatory significance - the Canadian point of view. [Lecture]

Campbell, D. J.

Journal of the Association of Official Analytical Chemists 61 (5) 1194-1197 (1978) [En]

[Health & Welfare Canada, Bureau of Vet. Med., Tunney's Pasture, Ottawa, Ontario K1A 0L2, Canada]

Criteria used in Canada for assessing drug acceptability and general methods of enforcement of regulations are discussed. Detailed studies on metabolism and toxicity of new drugs must be carried out; 'no-effect' doses must be calculated and assay methods must be capable of ensuring that the estimated human daily intake of residues is $< 1/1000$ of a no-effect level. Tissue residue studies must be carried out for each sp. for which a drug will be used, and should include muscle, liver, kidney, fat, and milk and eggs where appropriate and should be continued after treatment to show depletion rates (e.g. in milk after mastitis

treatment) to establish safe withdrawal times. In general, Canadian law requires that no detectable residues be present in foods; no exceptions are allowed for milk, but 9 drugs for which there are permitted tolerances in meat and eggs are listed. [See FSTA (1979) 11 4C194.] DIH

119

[Changes in DDT during processing of eggs and poultry meat.]

Peretolchin, N. V.; Shumkova, I. A.; Karnaukhov, V. V. *Trudy, Vsesoyuznyi Nauchno-issledovatel'skii Institut Myasnoi Promyshlennosti* 20, 70-75 (1976) [6 ref. Ru]

The nature of breakdown products of DDT formed during processing of eggs and poultry meat contaminated by pesticides was studied. Chicken meat sterilized in cans at 20-35-20-120°C sequence and freeze-dried eggs dehydrated at 35-50°C were used in the experiments. Chromatography was used to identify compounds formed during heat processing of meat. Changes occurring during heat processing differed and were probably catalysed by various groups of compounds. DDT breakdown in chicken meat was due to reducing agents e.g. the Fe complex. During freeze-drying of eggs and heat processing of eggs DDT changes were due to dechlorination accompanied by enzyme action. STI

120

Cadmium and the food chain: the effect of dietary cadmium on tissue composition in chicks and laying hens.

Leach, R. M., Jr.; Wang, K. W. L.; Baker, D. E. *Journal of Nutrition* 109 (3) 437-443 (1979) [24 ref. En] [Dep. of Poultry Sci., Pennsylvania State Univ., University Park, Pennsylvania 16802, USA]

The Cd content of body tissues and eggs was studied in broiler chicks and laying hens fed diets supplemented with 3, 12, and 48 µg Cd/g. The 48 µg level was selected as a slightly toxic level and the lower levels as representative of the amounts of Cd which would occur in feedstuffs due to environmental contamination. All levels of Cd resulted in increased Cd content of kidney while only 12 and 48 µg/g increased the Cd content of liver and muscle. Even 3 µg/g consistently increased the Cd content of liver and muscle but was not statistically significant. Transfer of dietary Cd to the egg was very low; only the 48 µg/g level increased Cd content of the egg. This dietary treatment also resulted in reduced egg production and egg shell thickness. AS

121

[Energy consumption in various methods of meat product stabilization.]

Brazhnikov, A. M.; Kamovnikov, B. P. *Myasnaya Industriya SSSR* No. 10, 13-14 (1978) [4 ref. Ru] [Moskovskii Tekh. Inst. Myasnoi i Molochnoi Promyshlennosti, Moscow, USSR]

Chilling is the basic method of stabilization of meat products; sterilization, spray-drying and freeze-drying are compared and equations to compute comparative coeff. are presented. These coeff. express the ratio of specific energy consumption to stabilize a given type of

meat product by a given method, and the equivalent energy consumption needed to chill the raw material within a corresponding period. The specific energy consumption for a 12-month storage period is (expressed as %) chilled storage 100, freeze-drying 98.5 and sterilization 22.1; for a 2.4-month storage period corresponding values are 100, 491.1 and 110.7 resp. Freeze-drying of meat is, energetically, approx. equivalent to refrigerated storage for 12 months, or to sterilization and subsequent storage for 2.4 months. The same method is used to evaluate spray-drying of egg melange, which is more efficient than refrigerated storage of eggs. STI

122

[Erratic oviposition of White Leghorn hens reared in cages.]

Otsuka, S.

Bulletin of National Institute of Animal Industry [Chikusan Shikenjo Kenkyu Hokoku] No. 32, 77-95 (1977) [7 ref. Ja, en]

740 White Leghorn laying hens were used in studies on erratic oviposition, in which 2 eggs stay in the shell gland together. Data are given for the incidence of erratic oviposition, the incidence of soft-shelled 2nd eggs in an erratic oviposition pair, wt., shell thickness and breaking strength of the 1st and 2nd eggs of a pair, and changes in Haugh scores during storage for ≤ 10 days. The 1st egg of a pair (i.e. the egg showing delayed oviposition) tended to have a thick, rough-surfaced shell and a low Haugh score. [From En summ. and tables.] AJDW

123

Variation in dimensions and shell weights of eggs collected from Japanese quail fed kepone with different level calcium diets.

Eroschenko, V. P.; Place, T. A.

Environmental Pollution 16 (2) 123-127 (1978) [9 ref. En] [Dep. of Biol. Sci., Univ. of Idaho, Moscow, Idaho 83843, USA]

1 group of Japanese quail was first fed a low Ca diet (0.50%) followed by a high Ca diet (3.5%) for 120 days each. A 2nd group of birds received the same diets containing 200 p.p.m. Kepone. Eggshell wt., and egg length and width of eggs from both groups were determined. Control quail eggshell width and eggshell wt. reached max. values approx. 50 days after the start of the low Ca diet. No similar peaks were recorded in Kepone-fed quail eggs; however, after 50 days the same eggshell measurements were significantly lower. By 120 days of the low Ca diet the differences between the control and Kepone-fed group eggs were negligible. Substitution and feeding of a high Ca diet to control quail produced egg size and eggshell wt. stabilization. Similar substitution and continued ingestion of Kepone in a high Ca diet eventually produced a severe and irreversible eggshell wt. reduction; there was, however, no comparable reduction in egg dimensions. The egg length was similar to that of the control while the width exceeded the control size. AS

124

Heat-resistant bacteria in pasteurized whole egg.

Payne, J.; Gooch, J. E. T.; Barnes, E. M.

Journal of Applied Bacteriology 46 (3) 601-613 (1979) [19 ref. En] [Food Res. Inst., Colney Lane, Norwich NR4 7UA, UK]

Samples of egg melange taken from an egg packing station contained an average of 7.3×10^4 organisms/ml which survived laboratory pasteurization at 65°C for 3 min. Many of the organisms surviving pasteurization were found to be coryneform bacteria related to *Microbacterium lacticum* which could be differentiated into several groups. The remainder were a miscellaneous collection of unidentified cocci and coccobacilli and some *Bacillus* spp. The coryneform bacteria were shown to be the most heat-resistant isolates with negligible loss of viability after 60 min at 65°C. At least 2 of the representative strains were very heat-resistant, 0.01% surviving 20 and 38 min at 80°C in phosphate buffer at pH 7.1. Growth tests showed that none of the isolates grew at 5°C after 10 days incubation but those capable of growing most rapidly at 10° and 15°C were also the most heat-resistant. Such strains had a doubling time at 15°C of between 6 and 8 h in whole egg. Freezing the coryneform bacteria in liquid whole egg at -18°C had negligible effect on viability or heat-resistance at 65°C. AS

125

Comparative and complementary effects of overwrapping and oil-treatment on quality of eggs stored under high room temperature.

Siddiqui, S. M.; Raghavender Rao, E.; Reddy, C. V.

Indian Veterinary Journal 54 (5) 392-396 (1977) [13 ref. En] [Coll. of Vet. Sci., Rajendranagar AP Agric. Univ., Hyderabad, India]

270 fresh eggs were used in a comparative study on methods for treatment of eggs before storage. Treatments studied were: (i) dipping in commercial egg-coating oil; (ii) spraying with egg-coating oil; (iii) overwrapping with polyethylene film; (iv) dipping in oil plus overwrapping; and (v) spraying with oil plus overwrapping. Control samples (vi) were not wrapped or treated with oil. The eggs were stored for 5, 10, or 15 days at 33.1°C and 40.9% RH. Tables of data are given for wt. loss, albumen index, Haugh unit score, yolk index and albumen and yolk pH. Overall, the results show treatments (i), (iv) and (v) to give the best quality retention during storage; overwrapping of (i) samples gave little or no increase in quality retention. AJDW

126

[Survey of methods for long term storage of poultry eggs. XII. Proportional parts, amounts of major chemical constituents and interior quality of fresh and stored Khaki Campbell duck eggs.]

Tanabe, H.; Ogawa, N.

Japanese Poultry Science [Nihon Kakin Gakkai-shi] 15 (1) 18-24 (1978) [10 ref. Ja, en] [Dep. of Human Nutr. & Food Sci., Gifu Women's Coll., Taromaru, Gifu 501-25, Japan]

Proportions of the parts, major chemical constituents, palatability and interior quality of fresh and stored Khaki Campbell duck eggs were checked and

compared with those of White Leghorn hens' eggs. Ducks and hens were 7 months old and individually housed. Selected characteristics of the fresh duck eggs were (mean of 20 eggs \pm s.e.): egg wt. 62.72 ± 0.91 g; albumen wt. 35.16 ± 0.52 g; yolk wt. 21.01 ± 0.41 g; shell wt. 6.55 ± 0.18 g; shell thickness 0.407 ± 0.002 mm; albumen moisture $88.29 \pm 0.15\%$; albumen crude protein $8.77 \pm 0.23\%$; albumen crude fat $0.13 \pm 0.03\%$; albumen crude ash $0.53 \pm 0.02\%$; yolk moisture $44.39 \pm 0.17\%$; yolk crude protein $15.26 \pm 0.53\%$; yolk crude fat $38.03 \pm 0.73\%$; yolk crude ash $1.45 \pm 0.03\%$; albumen height 8.45 ± 0.28 mm; yolk height 19.73 ± 0.26 mm; and albumen pH 7.77 ± 0.03 . No statistically significant difference in palatability between boiled duck and hens' eggs was found using a triangle difference test. Significantly higher internal quality measures, such as albumen height, albumen index and yolk height, were observed in duck eggs than in hens' eggs, when they were stored in a box kept at 25°C for 5, 10, 20, 30, 40 and 80 days. [See FSTA (1979) 11 4Q50 for part XI and following abstr. for part XIII] AS

127

Survey of methods for long term storage of poultry eggs. XIII. The effect of washing, oiling and holding on interior quality of hens' eggs.]

Tanabe, H.

Japanese Poultry Science [Nihon Kakin Gakkai-shi] 15 (2) 55-63 (1978) [7 ref. Ja, en] [Dep. of Human Nutr. & Food Sci., Gifu Women's Coll., Taromaru, Gifu 501-25, Japan]

The effects of washing, oiling and holding on interior quality of hens' eggs were studied. Eggs were stored in a non-air-conditioned room at 18.6-30.6°C for 1, 2, 3, 5 or 8 wk. Haugh unit scores and albumen heights of eggs oiled after washing were greater than those of unoiled, washed eggs. Eggs oiled after lay and then washed were higher in Haugh score and albumen height than eggs oiled after washing. In untreated eggs, a rapid increase in albumen pH was observed during the 1st wk of storage, pH peaking at 8 wk. In unoiled washed eggs, pH reached a peak (9.1) at 3 wk and decreased to 8.5 at 8 wk. Oiling after lay, whether or not followed by washing, resulted in a decrease in albumen pH. An oiling/washing combination usually reduced the incidence of rotten eggs after 8 wk storage, except in 2 treatments: washing followed by spray-oiling, and dip-oiling/washing/dip-oiling. [From En summ. See previous abstr. for part XII.] JRR

128

[Influence of packaging material on the quality of eggs during storage.]

Dzanic, H.; Abdic, F.; Mujic, I.

Hrana i Ishrana 19 (9/10) 465-475 (1978) [13 ref. Sh, en] [Tehnoloski Fak., Zagreb, Yugoslavia]

Comparative studies were conducted on eggs packaged in (i) Ovotherm-type transparent polystyrene packs or (ii) cardboard packs. The eggs were stored at 0° or 18°C, at 75% RH. Changes in the quality of eggs in (i) were slower than those in eggs in (ii); wt. losses of eggs in (i) were $\leq 50\%$ lower than those of eggs in (ii). The % of broken eggs was 0.83 in (i) vs. 9.71 in (ii). IN

129

[Influence of production method and storage on the food hygiene quality of eggs.] Einfluss der Faktoren Gewinnung und Lagerung auf die lebensmittelhygienische Qualität von Hühnereiern. Matthes, S.

Wiener Tierärztliche Monatsschrift 66 (4) 154-156, 158-159 (1979) [4 ref. De, en] [Inst. für Kleintierzucht, Dörnbergstrasse 25/27, D-3100 Celle, Federal Republic of Germany]

The contamination of eggs from free and caged chickens, and effects of storage and packaging were investigated. Results, shown graphically, revealed highest contamination levels in eggs from poultry houses without nesting boxes, and lowest contamination in eggs from caged hens. Considerable bacterial growth took place in the interval between laying and collection, and during storage: primary contamination, storage temp. and RH and packaging material all affected the penetration of the shell by contaminating bacteria. Packing in open trays and material based on wood shavings caused less bacterial growth than packaging in foam or transparent polystyrene. RM

130

Some unconventional feedstuffs to laying hens.

I. Effects on production and gross chemical composition of eggs.

Andersson, K.

Swedish Journal of Agricultural Research 9 (1) 29-36 (1979) [24 ref. En] [Dep. of Anim. Husbandry, Univ. of Agric. Sci., S-75007 Uppsala, Sweden]

144 Shaver 288 and 12 Hisex Brown laying hens were used in a 364-day feeding trial to investigate effects of various feed supplements on egg production and quality; supplements studied included 30% peas, 10% rapeseed meal, 52.9% Hiproly barley, 43.5% maize, 28% field beans, 11% leaf protein concentrate, 7% potato protein concentrate, 8.5% rapeseed protein concentrate, 12% Symba yeast, 2% phytosterols and 1% nicotinic acid. Tables of data are given, including egg wt., shell deformation, shell thickness, albumen height, Haugh unit score, yolk colour, egg wt., and DM, protein and fat%. Effects of the feed supplements studied on egg quality are discussed. Peas decreased shell thickness and increased shell deformation value; maize increased shell thickness. Rapeseed meal reduced albumen height. Field beans, leaf protein concentrate, Symba yeast and nicotinic acid increased albumen height and Haugh unit score. Potato and rapeseed protein concentrates gave eggs with a low DM concn. and low % yolk. No significant effects of diet on the protein content of the eggs were observed. Brown egg layers receiving rapeseed meal laid eggs with thinner shells than those laid by control hens; it is, however, uncertain whether this is a genetic or a feed-related effect. No such effect on shell quality was observed for white egg layers. Shell quality and albumen thickness decreased and fat content increased with increasing hen age. Maize, field beans or leaf protein enhanced and Hiproly barley adversely affected yolk colour. AJDW

131

Some factors affecting egg size and egg shell quality in the hens.

Wezyk, S.; Abdel-Kader, Y. M.

Roczniki Naukowe Zootechniki 6 (1) 155-164 (1979) [13 ref. En, pl, ru] [Dep. of Poultry Sci., Inst. of Anim. Production, Krakow, Poland]

4 hybrid groups (H₃₄, L₉₆, HL_{34,6} and LH₅₂) and 1 purebred strain (L₄₆) of White Leghorn hens in their first yr of laying were used in a study on effects of hen genotype and age on egg size and shell quality. Eggs were collected at hen ages of 24, 32, 40, 48 and 56 wk, and egg wt., shell wt., shell sp. gr. and shell thickness determined. The results show that egg wt. and shell wt. increased with increasing hen age. Shell thickness and sp. gr. decreased during the period ≤40 wk hen age, increased at 48 wk, then decreased again. Hen genotype significantly influenced all egg characteristics studied; also significant hen age × genotype interactions were observed for all egg characteristics studied. AJDW

132

[Eggs and their culinary use.]

Longue, E.

Revue Technique des Hotels et Restaurants No. 336, 375, 377-378, 381, 383-384 (1977) [Fr]

The culinary use of whole eggs, egg yolk and egg white is discussed, with reference to differences between free-range and battery eggs, the structure of eggs, cooking methods, nutritional value, and use as an ingredient in food products. AJDW

133

[Concentration of eggs by ultra-filtration and spray-drying.]

Tsarikov, N. N.; Lyalin, V. A.; Volgin, V. D.; Nazarov, V. D.

Trudy, Vsesoyuznyi Nauchno-issledovatel'skii Institut Myasnoi Promyshlennosti 20, 81-86 (1976) [Ru]

The most favourable conditions for egg concn. by ultra-filtration and by drying were studied. Whole eggs and egg whites were concn. using metal/ceramic membranes (0.05 and 0.25 m²); dehydration was carried out with a disc sprayer at inlet air temp. of 150 to 200°C and outlet air temp. of 65-90°C. The most efficient ultra-filtration was achieved at a pressure of 7 atm, membrane velocity 180 rev/min and 3 mm distance between the membranes. Concn. of eggs to 40% DM resulted in doubled output of the driers. Dehydration at higher temp. (200°C inlet air) did not produce quality deterioration of the dried product. Dehydration of eggs with damaged shells by the above drying method yielded a dried product of standard quality. STI

134

[Effect of thermal processing on the sanitary and bacteriological quality of eggs.]

Bulychev, O. A.; Stepanov, V. A.; Kozlova, A. L.

Trudy, Vsesoyuznyi Nauchno-issledovatel'skii Institut Myasnoi Promyshlennosti 20, 87-93 (1976) [8 ref. Ru]

The effect of low temp. and different thawing methods on the bacteriological quality of egg contents was studied. Freezing was carried out at -18° , -25° and -40°C until the temp. in the centre of the sample dropped to -6°C . Prior to and following refrigeration the total count of bacteria was determined plus counts of coliform bacteria, enterococci, bacteria of the Proteus group and salmonellae. Defrosting was carried out in air at 20°C , or in flowing water at 15°C and 20°C for 2 h, followed by grinding and stirring. The largest fall in total count of bacteria was observed in eggs refrigerated at -25°C . Defrosting in air followed by grinding and stirring is recommended as the most satisfactory. STI

135

[Bacteriological quality of quick-frozen egg sausages.]

Chernova, G. G.; Krainyaya, V. S.; Popkov, V. N.; Stepanov, V. A.; Toptun, N. Yu.; Gonotskii, V. A. *Trudy, Vsesoyuznyi Nauchno-issledovatel'skii Institut Myasnoi Promyshlennosti* 20, 94-97 (1976) [3 ref. Ru]

Egg sausages were produced from eggs with damaged shells stored for a max. of 24 h. When blended with various ingredients the egg mass was stuffed into polymer or cellulose casings 60-80 mm long and weighing 40-50 g; the sausages were cooked at 95° to 100°C for 10 to 13 min. When cooled the product was refrigerated at -35°C . Total count of bacteria was then determined plus the counts of intestinal bacteria, salmonellae, Proteus, staphylococci and anaerobes. When egg sausages were quickly frozen and stored at -18°C the bacteriological counts remained unchanged for 3 months. STI

136

Comparison of whole egg to Egg Beaters as a source of dietary protein.

Ryan, J. R.; Kienholz, E. W. *Nutrition Reports International* 19 (3) 363-370 (1979) [10 ref. En] [Dep. of Anim. Sci., Colorado State Univ., Fort Collins, Colorado 80523, USA]

Egg Beaters (a cholesterol-free egg substitute product) was compared with whole egg as a source of protein in 2 tests with chicks. From results obtained it is concluded that when cooked and fed in a palatable form, Egg Beaters is a satisfactory source of protein to support adequate chick growth. SP

137

Dietary salt for layers.

Leeson, S.; Summers, J. D. *Nutrition Reports International* 19 (2) 173-178 (1979) [13 ref. En] [Dep. of Animal & Poultry Sci., Univ. of Guelph, Guelph, Ontario, Canada]

Field reports suggested a deficiency of sodium may occur with corn-soybean diets, since enhanced salt levels result in reduced feed intake and improved shell quality. A commercial strain of single combed White Leghorns were offered ad lib. 16.2% crude protein, 2834 kcal/kg corn soybean diets containing 0.16%

(conventional) or 0.25% Na, 0.36 or 0.56% available P and 3% Ca contributed predominantly by limestone or a 1:2 mixture of limestone and oystershell. The treatments were arranged factorially and used for eight 28 day periods. Significant differences for egg production, egg wt. and shell deformation were effected by 1st and 2nd order interactions. Within these interactions birds consuming the low vs. high Na, and low vs. high P diets, generally produced more eggs. Increasing the level of Na failed to elicit any advantageous changes in performance. Although egg size was increased when a high-salt, high-P diet was used, the converse was true when the combination with low P was used. Birds consuming the high salt diet in combination with limestone produced eggs of significantly inferior shell quality compared to those derived from all other treatments. The use of oyster shell per se did not improve shell quality. Differences in response by laying birds to added salt are discussed in relation to environmental conditions. It is concluded that when laying house temp. is maintained at $20 \pm 5^{\circ}\text{C}$, no advantage accrues from increasing the salt content of corn-soybean diets $> 0.25\%$, and that the National Research Council requirement value of 0.15% sodium appears adequate. AS

138

Quantitative studies of mercury and cadmium deposition in Japanese quail through multiple generations.

Eskeland, B.; Gullvag, B. M.; Nafstad, I. *Acta Agriculturae Scandinavica* 29 (2) 113-118 (1979) [8 ref. En] [Dep. of Poultry & Fur Anim. Sci., Agric. Univ. of Norway, 1430 As-NLH, Norway]

This paper gives data from a 4-generation feeding trial with Japanese quail, fed diets with or without various Hg levels (≤ 8 p.p.m.) and, in the 3rd and 4th generations, with or without added Cd (≤ 15 p.p.m.). Tables of data are given for Pb and Cd concn. in tissues (brain, liver, heart) and in egg yolk, albumen and shell. Hg concn. in eggs and tissues tended to increase with increasing dietary Hg concn.; Cd concn. of tissues (but not eggs) increased with increasing dietary Cd concn. Effects of interaction between dietary Hg and Cd levels on tissue Hg concn. are described. AJDW

139

[Genetic and seasonal effects on the interior egg quality in Alexandria cross lines, Fayoumi and Dokki-4 chickens.]

Khalifah, M. M.; Shawer, M. F.; Kosba, M. A.; Khalil, A. A.

Beiträge zur Tropischen Landwirtschaft und Veterinärmedizin 16 (4) 423-430 (1978) [21 ref. En, es, de, fr, ru] [Fac. of Agric., Univ. of El-Mansoura, Alexandria, Egypt]

Comparison of internal egg quality traits, i.e. albumen height, Haugh units and yolk index, showed significant differences between breeds only with regard to the yolk index (mean value 0.60 ± 0.01 for purebred Fayoumi, 0.51 ± 0.02 for the Alexandria colour line cross). All 3 quality traits differed significantly with the season: max. mean albumen height, 7.26 ± 0.25 mm and Haugh

unit value, 88.11 ± 3.99 were obtained in summer; max. mean yolk index, 0.59 ± 0.00 , in winter. Significant population \times season interactions indicate differences in the changes of these characteristics throughout the seasons. AS

140

[Quality of eggs in relation to contents of vitamins A and D₃ in the hens' rations.]

Nanos, V. R.; Shpits, I. S.

Trudy, Vsesoyuznyi Nauchno-issledovatel'skii Institut Myasnoi Promyshlennosti 20, 116-120 (1976) [Ru]

Egg quality from cage layers fed various additions of vitamins A and D₃ to the rations was studied. Vitamin A in the form of a Dutch preparation was added in amounts of 7, 10 and 15 million IU/t of feedingstuff; vitamin D₃ (crystalline domestic product Videin) was added as 1.2 and 3 million IU/t. Eggs of the best quality were obtained from cage layers fed rations containing 10 million IU vitamin A and 2 million IU vitamin D₃/t, or the 15:1 ratio of these vitamins which is recommended for improving the nutritive quality of eggs. STI

141

[Application of electroimmunodiffusion to food products. II. Rapid method for determining egg in food products on Cellogel.] [Lecture]

Flego, R.; Borghese, R.

Bollettino dei Chimici dei Laboratori Provinciali 5 (1) 180-187 (1979) [5 ref. It] [Lab. Chimico Provinciale, Via Colugna 42, 33100 Udine, Italy]

Detn. of eggs in food products by Laurell's electroimmunodiffusion method on Cellogel IM sheets is described. It was successfully applied to samples of fresh and old pasta (partly denatured egg protein): denaturation of egg protein during ageing had no significant effect on its reaction with various antisera (anti-hen, -egg, -ovalbumin, -yolk). [See FSTA (1977) 9 5M675 for part I.] [See FSTA (1979) 11 11A776.] RM

142

[Veterinary hygiene aspects of the use of antibiotics in animal feed.]

Manoiu, I.; Nemteanu, S.

Revista de Cresterea Animalelor 28 (11) 33-37 (1978) [17 ref. Ro]

The use of antibiotics in the feed of slaughter animals, poultry and dairy cattle is discussed, with reference to the possible adverse implications for the wholesomeness of foods of animal origin (meat, eggs, dairy products); aspects considered include residues of antibiotics and their metabolites in foods of animal origin, human allergy to antibiotics, selection for antibiotic-resistant bacteria, and transfer of resistance between bacterial strains or species. AJDW

143

A microwave method for grading agricultural products.

Kashyap, S. C.; Vachon, F.

Journal of Microwave Power 14 (1) 35-39 (1979) [3 ref. En] [Nat. Res. Council of Canada, Ottawa, Ontario KIA 0R8, Canada]

A microwave method for non-contact and continuous grading of agricultural products by wt. or by vol. is described. The product items can be transported on a conveyor belt and do not have to be oriented in any particular direction. An open-ended cavity is used for a sensor, the design of the cavity and the electronic circuitry for measuring the resonant frequency are described in detail. Experimental results for grading of apples and eggs are also presented. SP

144

[New machinery for freezing liquids and pasty products.]

Chevrot, C.

Revue Generale du Froid 70 (4) 233-234 (1979) [Fr]

This lecture discusses the machinery available for freezing liquid and pasty foods to produce products in small pieces (by freezing on a scraped surface); granules (by pulverization in cold air or a cryogenic fluid); and products of determined size (by brine immersion in impermeable packaging). The conditions for freezing eggs, blood, fish soup and enriched milk (150 g fat/l.) are tabulated. RM

145

[Tray for transporting and stocking fragile objects such as eggs.]

David, P. A.

French Patent Application 2 400 468 (1979) [Fr]

Eggs are packed in square or rectangular trays containing alternate rows of depressions and peaks, in which the eggs are nested. The rows are arranged at 40° to the sides of the trays, thereby enabling more eggs than usual to be packaged. W&Co

146

[Milk and milk products are nutritionally and physiologically valuable and versatile.] Milch und Milchprodukte sind ernährungsphysiologisch wertvoll und vielseitig.

Ketzer, E.

Deutsche Milchwirtschaft 30 (22) 812, 814 (1979) [De]

Nutritional aspects of milk are discussed with particular reference to digestibility and contents of protein and minerals in relation to nutritional requirements. In terms of the cost per unit of protein (17.5 g), skim-milk quarg (at DM 0.32) was the cheapest animal protein source, followed by eggs (DM 0.62), buttermilk (DM 69.0) and whole milk (DM 0.70); pork (at DM 1.74) was the most expensive. FL

147

Rapeseed meal goitrogens and egg taint.

Pearson, A. W.; Butler, E. J.; Fenwick, G. R.

Veterinary Record 104 (8) 168 (1979) [10 ref. En] [Houghton Poultry Res. Sta., Huntingdon, Cambs., UK]

The theory that 'fishy' or 'crabby' taints in eggs from hens fed rapeseed meal is due to the hens' inability to convert trimethylamine (TMA), released from dietary constituents, to the odourless and tasteless N-oxide was

investigated. This paper reports an experiment in which the inclusion of synthetic 5-vinyl-2-oxazolidine-thione (OZT) in a rapeseed-free diet depressed TMA oxidation to the same extent as a high glucosinolate rapeseed meal and also resulted in the production of tainted eggs. From the results it is concluded the OZT did not cause significant inhibition of TMA oxidase but that it impaired thyroid function and hence TMA oxidase synthesis. [See also following abstr.] SP

148

Rapeseed meal and egg taint: demonstration of the metabolic defect in male and female chicks.

Pearson, A. W.; Butler, E. J.; Curtis, R. F.; Fenwick, G. R.; Hobson-Frohock, A.; Land, D. G.

Veterinary Record 104 (14) 318-319 (1979) [5 ref. En] [Houghton Poultry Research Sta., Huntingdon, Cambs., UK]

Shaver 585 chicks (97 females and 102 males) reared ≤ 3 wk of age on a commercial starter diet, in cages, were then fed a diet containing 10% rapeseed meal from a high glucosinolate strain of *Brassica napus*, for 17 days. On day 15, chicks were injected intravenously with ^{14}C -trimethylamine (^{14}C -TMA) hydrochloride and blood samples taken 18 min later. Results of the ^{14}C -TMA test showed that the chicks could be separated into 2 populations, those with ^{14}C -TMA oxidase in plasma < 0.15 nmol/ml and those with > 0.15 nmol/ml. 79.4% of females had peak ^{14}C -TMA oxidase levels < 0.15 nmol/ml, and of this 79.4%, 44.6% were identified as 'tainters'. Plasma ^{14}C -TMA oxidase levels in males were similar to those in females. From the results it is concluded that rapeseed meal impairs the TMA oxidation capacity of chicks selectively, that males and females do not differ markedly in their sensitivity to the meal, and that the ^{14}C -TMA test can only give unequivocal results for 'non-tainters'. [See also preceding abstr.] SP

149

Technical note: Detection of incubator rejects in whole eggs after normal commercial processing.

Jones, J. M.; Ellingworth, C. E.

Journal of Food Technology 14 (2) 199-203 (1979) [3 ref. En] [ARC Food Res. Inst., Colney Lane, Norwich, NR4 7UA, UK]

Effects of normal commercial processing on detn. of β -hydroxybutyric acid (βHBA), a characteristic component of 'incubator rejects' (fertilized eggs that have not developed into chicks) were studied. Following samples were prepared: (i) fresh non-pasteurized liquid egg and (ii) 1:1 mixture of fresh non-pasteurized liquid egg and non-pasteurized liquid incubator reject egg. Levels of βHBA (mg/100 g egg) were, in untreated (i) and (ii), 0.5-0.6 and 5.26-5.33, resp.; after pasteurization 0.04-0.05 and 5.17-5.22; and after pasteurization and spray-drying 0.06-0.08 and 4.98-5.10 (reconstituted to 25% solids). Differences in βHBA content between liquid egg and spray-dried egg were not significant. Neither pasteurization nor spray-drying introduced interfering compounds. βHBA concn. remained stable during 12 months of frozen (-20°C) storage of pasteurized (i) and (ii). Liquid egg containing

> 0.2 mg $\beta\text{HBA}/100$ g is considered to be adulterated with incubator rejects. DIH

150

The association of reproductive traits, measures of egg quality and the plasma content of calcium, phosphorus and yolk lipophosphoprotein precursor in poultry.

Strong, C. F., Jr.

Dissertation Abstracts International, B 38 (8) 3549-3550: Order no. 77-24714, 102pp. (1978) [En] [Ohio State Univ., 190 North Oval Drive, Columbus, Ohio 43210, USA]

In 2 nondwarf strains of broiler-type chickens, egg wt. showed a curvilinear relationship to absolute and relative amounts of yolk and albumen in the egg; quadratic effect of egg wt. on yolk quantity was negative, whereas effect on albumen quantity was positive. Significant curvilinear relationships were found between yolk wt. and wt. of other egg components for a dwarf broiler strain. These quadratic effects were not important in dwarf egg-type hens or in medium- or large-bodied turkeys. High positive correlation coeff. ($r > 0.5$) were observed between egg wt. and absolute wt. of the component parts of the egg in all strains of chickens and turkeys studied. In turkeys and broiler chickens, relative amounts of shell and of yolk tend to be negatively correlated with egg wt., whereas % albumen is positively correlated. No significant correlations between relative amounts of egg components in layer-type chickens were found. AJDW

151

[Thinning of egg white in hens' eggs.]

Lukasova, J.; Holec, J.; Napravnik, A.

Prumysl Potravin 29 (9) 493-495 (1978) [15 ref. Cs] [Katedra Higieny a Tech. Potravin, Vysoka Skola Vet., Brno, Czechoslovakia]

(i) 280 eggs of Shaver Starcross 288 layers obtained from 3 co-operative farms showing a 15-20% incidence of substandard eggs and rapid deterioration of quality and thinning of egg white on keeping were examined. Whites were divided into thick and thin fractions, and their respective viscosities, pH, and contents of DM, K, Ca and Na, and concn. of 16 amino acids in hydrolysates were determined; Ca content and thickness of shells were measured, and their histological structure after decalcification was assessed. Most of the eggs were in the wt. categories E (> 64 g, 17%), A (59-63.9 g, 46%) and B (54-58.9 g, 29%). As the egg-white defect was more prevalent in larger eggs, (ii) A and E eggs from a farm not showing the defect were used as controls. The results are presented in detail (mostly graphically) and the significance of differences is discussed. Contents of K and Na were significantly higher in thin white of (i) than in that of (ii), and (i) shells differed significantly from (ii) shells in lower Ca contents and smaller thickness and showed a less dense structure of the palisade layer. None of the other (i)-(ii) differences were significant. Possible causes of the defect are discussed against the background of these findings. SKK

152

[Detection of hatchery reject eggs in whole egg products.]

Cattaneo, P.; Neri, M.; Cantoni, C.

Industria Alimentare 18 (1) 31-34 (1979) [13 ref. It, en] [Istituto di Ispezione degli Alimenti di Origine Anim., Univ. degli Studi di Milano, Milan, Italy]

Potential detection of hatchery reject eggs added to dried or liquid whole egg products was studied. Tables of data are given for concn. for total SH groups, non-protein SH groups and proteinaceous reducing substances (PRS) in fresh egg, eggs stored at 25-27°C, and hatchery reject eggs. Results show that differences in total and non-protein SH group concn. were insufficient for clear discrimination between fresh and hatchery reject eggs. Differences in PRS concn. (mg/100 g) were, however, considerable: fresh eggs had a mean PRS concn. of 20.9 (range 16.4-25.7), whereas hatchery rejects had a mean PRS concn. of 58.5 (range 46.8-87.0). PRS concn. increased with increasing hatchery reject content in hatchery reject/fresh egg blends. Limit of detection was approx. 20% added hatchery reject eggs. AJDW

153

The comparison of the deep litter system of three structural patterns with the cage management system for layers under tropical conditions.

Oluyemi, J. A.; Fetuga, B. L.; Phillips, I. O.

East African Agricultural and Forestry Journal 42 (3) 342-349 (1977) [23 ref. En] [Dep. of Anim. Sci., Univ. of Ibadan, Ibadan, Nigeria]

1000 Rhode Island Red laying hens (20 wk of age at start of trial) were used in a study on effects of housing system on laying performance, egg quality etc. 4 housing systems were studied: (i) stair-step cages, 2 birds/compartments; (ii) deep litter, housing with 1 open side; (iii) deep litter, all sides open; and (iv) part deep litter, part wire floor, all sides open.

Characteristics studies included egg production, egg wt., shell wt. and Haugh unit score of the eggs. Results show (ii) gave significantly lower egg production and Haugh score than (i), (iii) or (iv); egg wt. and shell thickness did not differ significantly between housing treatments.

AJDW

154

Genetic and physiological control of yolk production in three strains of small bodied chickens.

Shivaprasad, H. L.

Dissertation Abstracts International, B 38 (11) 5219: Order no. 78-06202, 173pp. (1978) [En] [Ohio State Univ., 190 North Oval Drive, Columbus, Ohio 43210, USA]

3 strains of hen (D3 which carried the sex-linked dw gene, D6 which carried the dw^B gene, D7 which were from normal bodied Babcock commercial white Leghorns) aged 21-23 months were examined. Studies were made of various characteristics including egg wt., wt. of egg components, egg production, average daily yolk production, occurrence of blood and meat spots in the eggs, body wt., shank length, blood plasma lipophosphoprotein and Ca, and liver colour, wt. and lipids. The data obtained were used to calculate

heritabilities and phenotypic, genetic and environmental correlations for these characteristics. D3 eggs had significantly less yolk, less shell and a greater % of albumen than D6 and D7 eggs, while D7 eggs had significantly more blood and meat spots than D3 and D6 eggs. Heritability estimates were high in both individual and combined strains for, e.g. % yolk and % albumen, but were highly variable within and in combined strains for, e.g. % yolk, meat and blood spots and yolk production. Genetic and phenotypic correlations between egg wt. and wt. of egg components were positive and large in both individual and combined strains. JA

155

[Pesticide residues in eggs from commercial farms.]

Marinova, Ts.; Koleva, R.

Veterinarnomeditsinski Nauki 15 (10) 95-98 (1978) [9 ref. Bg, ru, en] [Raionna Vet. Sta., Tokbukhin, Bulgaria]

During 1975-1976, 200 eggs were obtained at all seasons from the Donchevo farm, 180 from the Tsarevets farm and 126 from the Spasovo farm, all in Tolbukhin district. The eggs were examined by TLC for pesticide residues. No chlorinated hydrocarbon pesticides were detected in any of the eggs; of the organophosphorous pesticides, only Neguvon (trichlorfon) was detected at 0.1 p.p.m. in 23 of the Donchevo eggs and 13 of the Tsarevets eggs; it was not present in any of the Spasovo eggs. SKK

156

[Studies on pasteurization and quality maintenance of egg for industrial use. I. Homogenization of raw liquid egg through filtering.]

Yamanaka, Y.

Japanese Journal of Dairy and Food Science [Rakuno Kagaku Shokuhin no Kenkyu] 28 (2) A79-A83 (1979) [12 ref. Ja, en] [Lab. of Anim. Products Tech., Tokyo Univ. of Agric., Sakuragaoka, Setagaya-ku, Tokyo]

Raw liquid egg was homogenized by forced filtration, and homogenization efficiency was evaluated in relation to whipping properties. Results show that filtration time increased with increase in fineness of the stainless steel filter mesh. With filter mesh of 20 and > 28 satisfactory filtration efficiency could not be obtained. High foaming properties were obtained using 20 or 24 filter mesh but were lowered using > 28 mesh filters. Whipped foam of raw liquid egg filtered through a 24 mesh filter was stable, but was significantly unstable in raw liquid egg filtered through > 28 mesh filter. It was concluded that uniform whole egg with desirable homogenization efficiency may be obtained by filtration through a 24 mesh filter. [From En summ.] SP

157

[Studies on pasteurization and quality maintenance of egg for industrial use. II. Homogenization of raw liquid egg by homogenizer.]

Yamanaka, Y.

Japanese Journal of Dairy and Food Science [Rakuno Kagaku Shokuhin no Kenkyu] 28 (2) A85-A90 (1979) [10 ref. Ja, en] [Lab. of Anim. Products Tech., Tokyo]

Univ. of Agric., Sakuragaoka, Setagaya-ku, Tokyo]

Raw liquid egg was homogenized by a mechanical homogenizer, and the homogenization efficiency (bacteriological quality and whipping properties) compared with homogenization by forced filtration. 6 samples of raw liquid egg after filtration (with or without mechanical homogenization) showed direct microscopic counts of $1.6-2.4 \times 10^6$ and standard plate counts of $\leq 1.3 \times 10^3$ [sample quantity not specified]. Counts were lower for filtration without mechanical homogenization. Coliform counts were positive in all raw liquid samples used. Direct microscopic and standard plate counts increased appreciably when raw liquid egg was homogenized under pressure of 140 kg/cm^2 at 50°C ; increase in standard plate counts may be traced to dispersion of bacterial clumps and to some bacterial contamination from dirty homogenizers. Raw liquid egg homogenized by filtration had better whipping properties than that mechanically homogenized. It was concluded that raw liquid egg obtained by forced filtration had higher quality and better whipping properties than that obtained by mechanical homogenization. [From En summ.] [See preceding abstr. for part I.] SP

158

The effect of level of sinapine in a laying ration on the incidence of fishy odor in eggs from brown-shelled egg layers.

Goh, Y. K.; Clandinin, D. R.; Robblee, A. R.; Darlington, K.

Canadian Journal of Animal Science 59 (2) 313-316 (1979) [11 ref. En] [Dep. of Anim. Sci., Univ. of Alberta, Edmonton, Alberta, T6G 2E3 Canada]

Triplicate groups of 4 Rhode Island Red layers which had been previously found to lay fishy eggs when fed a ration containing 10% rapeseed meal (RSM) were fed a laying ration, devoid of RSM, to which 0, 0.5, 1.0, 2.0 or 4.0 g of sinapine (as bisulphate)/kg of ration was added. Eggs produced were analysed for trimethylamine and scored organoleptically for fishiness. Inclusion of $> 1 \text{ g}$ of sinapine/kg of laying ration caused the birds to lay eggs with a fishy odour. The finding suggest that when RSM is included in the ration of such birds, the level of usage should be such that the ration will contain not more than 0.1% sinapine. AS

159

E-3-A Sanitary Standards for scraped surface heat exchangers.

International Association of Milk, Food & Environmental Sanitarians; United States of America, Department of Agriculture; United States of America, Poultry & Egg Institute of America; United States of America, Dairy & Food Industries Supply Association
Journal of Food Protection 42 (4) 371-374 (1979) [En]

Design, material and fabrication criteria are given to cover the sanitary aspects of scraped surface heat exchangers for use with liquid egg products. DIH

160

Practical problems in implementation of microbiological standards.

Davey, G. R.

Food Technology in Australia 30 (7) 266-270 (1978) [En] [Div. of Analytical Lab., Health Commission of NSW, Lidcombe, NSW 2141, Australia]

The main provisions of the principal food hygiene regulation in New South Wales, Regulation 77, Protection of Food from Contamination, are considered. 2 recent food poisoning incidents involving the consumption of spaghetti and meat sauce, which illustrate the need for having temp. regulations for food preparation are described. The 3 major requirements for a rational and meaningful standard are considered. Microbiological standards for specific foods namely prawns and shrimps, oysters, desiccated coconut, and liquid egg, contained in the NSW Pure Food Act are discussed. It is concluded that these standards are ill-defined and totally inadequate. VJG

161

An appraisal of potential benefits to the egg industry from selling eggs by weight.

Thompson, J. C.; Cheng, R.

Research Bulletin, Agricultural Experiment Stations, University of Georgia No. 218, 38pp. (1978) [31 ref. En] [Univ. of Georgia, Coll. of Agric., Athens, Georgia 30602, USA]

The potential impact on the egg industry from a shift to selling eggs by wt. instead of by the dozen was examined. Evaluation was made on a group basis, i.e. effect of the change on the egg pricing system, egg producers, packers, operations in retail stores, and consumers. Overall, it was concluded that significant gains would accrue from the change. RM

162

There's scope for EPS in food packaging.

United Kingdom, Expanded Polystyrene Association
Food Processing Industry 48 (568) 55-56 (1979) [En] [PO Box 103, Haywards Heath, W. Sussex RH16 3JZ, UK]

The advantages of expanded polystyrene (EPS) for food packaging are listed. Consideration is given to: the use of an EPS beaker for cream in Germany; effects of EPS on foods; a new process for producing a 10 egg pack from foamed low density polystyrene; and the economics of EPS. VJG

163

Studies on preparation and keeping quality of pickled quail eggs. (In 'Proceedings of the First Indian Convention of Food Scientists and Technologists' [see FSTA (1979) 11 12A871]) [Lecture]

Tipshetti, M. S.; Panda, B.

pp. 88-89, No. 8.8 (1979) [En] [Div. of Poultry Res., Indian Vet. Res. Inst, Izatnagar, India]

Fresh quail eggs were cooked at 80°C for 20 min in water containing 2% NaCl and 2% NaHCO_3 , cooled in running water, peeled, placed in bottles, and covered with a pickling solution prepared by heating acetic acid and salt or vinegar and salt at 85°C for 20 min, followed by filtration. The bottles were capped and stored for 1 month at room or refrigerator temp. During storage, pH of the pickling solution increased for 4 h and then remained constant, while pH of egg albumen decreased

for 4 h and then remained constant; the decrease in yolk pH was more gradual. Salt content of the eggs was related to salt content of the pickling solution. Low microbial loads were found at both storage temp. Acceptability scores indicated preference for eggs pickled in 50% vinegar and 8% salt or in 3% acetic acid and 8% salt. JA

164

[Dried comfrey meal (*Symphytum* sp.) in hens' diets.] Aiki, J.; Favoretto, V.; Castilho, A. C.; Oliveira Filho, J. J.

Cientifica 6 (3) 477-481 (1978) [5 ref. Pt, en] [Dep. de Producao Anim., Fac de Ciencias Agrarias & Vet., Jaboticabal, Brazil]

The dried comfrey consisted of 82.56% DM, 23.70% crude protein, 0.99% ether extract, 8.01% crude fibre, 16.30% minerals and 33.56% non-N extractives. When fed at levels of $\leq 8\%$ in hens' diets, it improved egg production, had no effect on shell thickness or Haugh score, but considerably improved yolk colour (in accordance with the equation $Y = 20.24 + 0.45X$, where Y is yolk colour according to Roche, and X is the % comfrey in the diet). HBr

165

[DDT detection in the quail egg.]

David, D.

Comptes Rendus Hebdomadaires des Seances de l'Academie des Sciences, D 285 (15) 1347-1350 (1977) [4 ref. Fr, en] [Lab. de Biol. Anim., Univ. de Clermont-Ferrand, BP No. 45, 63170 Aubiere, France]

Significant residues of DDT were found in the white and yolk of quail eggs after external treatment of the shell with an aqueous suspension of commercial DDT. The rate of pesticide migration into the egg varied according to shell porosity and thickness. Residues of DDT were also found in control eggs and in industrial quail food. AS

166

[The optimum energy level in laying hen feed.]

Untersuchungen zum optimalen Energiegehalt im Legehennenfutter.

Richter, G.; Jeroch, H.

Archiv für Tierernährung 28 (11/12) 709-722 (1978) [21 ref. De, en, ru] [Sektion Tierproduktion & Vet. Med., Karl-Marx-Univ., Leipzig, German Democratic Republic]

Groups of White Leghorn hybrid laying hens were used in a feeding trial over the age range 23-74 wk of age, conducted to evaluate effects of dietary energy level (463-619 hen energy feed units/kg feed) on laying performance, and carcass composition. Tables of results are given. No significant effect of dietary energy level on carcass composition was observed; however, fat content of the carcass increased and protein content of the carcass decreased with increasing energy level in the feed. AJDW

167

Coho salmon (*Oncorhynchus kisutch*) and herring gulls (*Larus argentatus*) as indicators of organochlorine contamination in Lake Ontario.

Norstrom, R. J.; Hallett, D. J.; Sonstegard, R. A.

Journal of the Fisheries Research Board of Canada 35 (11) 1401-1409 (1978) [25 ref. En, fr] [Dep. of Fisheries & the Environment, Canadian Wildlife Service, Wildlife Toxicology Div., Ottawa, Ontario K1A 0E7, Canada]

Organochlorine residues were determined in the muscle and liver of coho salmon from western Lake Ontario, pooled alewife (*Alosa pseudoharengus*) and smelt (*Osmerus mordax*) from the stomach contents of the salmon, and in herring gull eggs from 4 eastern Lake Ontario colonies. Levels of organochlorine compounds found in 28 samples of coho salmon muscle (mg/kg wet wt.) were: PCB, 5.77; p,p'-DDE, 0.97; mirex, 0.23; photomirex, 0.11; HCB, 0.097; β -HCH, 0.012; oxychlordane, 0.016; heptachlor epoxide, 0.015; dieldrin, 0.087; and p,p'-DDD, 0.110. Data are also given for alewives and smelt, coho salmon liver, and herring gull eggs. VJG

EGG PRODUCTS

1

[Labelling of bakery products in the USA.]

Kennzeichnung von Backwaren in den Vereinigten Staaten von Amerika.

Vetter, J. L.; Dubois, D. K.

Getreide, Mehl und Brot 32 (5) 119-121 (1978) [De]
[An-Inst. of Baking, Manhattan, Kansas 66502, USA]

The current regulations on label declarations necessary in the USA are briefly discussed with respect to bakery products and their ingredients. Typical label declarations for enriched bread are given, as well as lists of recognized descriptions for milk products, egg products and wheat milling products. Typical declarations of fat and oil contents, raising agents and dough additives are given, and the role of the FDA in setting standards of identity is discussed. Bakery products consisting of separate parts, e.g. crust and filling of pies, are also mentioned; it is proposed that the ingredients used in each part be listed separately in decreasing order of occurrence. DIH

2

Moulded egg foodstuff.

Denmark, Dansk Andels Aegexport Moulding

British Patent 1 503 329 (1978) [En]

Moulding apparatus is described for preparing an elongated food product in the form of an egg yolk core with an egg white outer layer. IFT

3

Thiamine content and palatability of quick breads made with soy-egg flours.

Howarter, K. B.; Klein, B. P.

Journal of Food Science 43 (3) 1010-1011 (1978)
[12 ref. En] [Div. of Foods & Nutr., School of Human Resources & Family Studies, Univ. of Illinois, Urbana, Illinois 61801, USA]

Full fat soy (S), 85% full fat soy + 15% egg (85S) and 75% full fat soy + 25% egg (75S) flours were prepared and substituted for 10, 20 or 30% of the wheat flour in a chemically leavened quick bread. Thiamin content of the breads was significantly lower than that of the control, and was affected by the level of substitution. Sensory evaluation of the quick breads indicated that acceptable products could be made with $\leq 30\%$ substitution of S, 85S and 75S flours, although scores decreased with increasing levels of the soy flours. IFT

4

Low cholesterol egg product and process.

Fioriti, J. A.; Spotholz, C. H.; Stahl, H. D.; Sims, R. J.
(General Foods Corp.)

United States Patent 4 103 040 (1978) [En]

A process is described for producing a low cholesterol egg product which resembles the unmixed contents of a natural egg in which natural egg yolk is modified so that it has a ratio of polyunsaturated fat content to saturated fat content ≥ 1 , and a cholesterol content lower than that of natural egg yolk. IFT

5

The thiocyanate content of egg from hens fed on a diet containing rapeseed meal. [Lecture]

Shuaib, A. C. A.; Beswick, G.; Tomlins, R. I.

International Congress of Food Science & Technology - Abstracts p.247 (1978) [En] [Dep. of Applied Biol. & Food Sci., Polytech. of the South Bank, London SE1 OAA, UK]

The lactoperoxidase/thiocyanate/H₂O₂ system (LP system) is known to have an antimicrobial effect in milk and other biological fluids. A study was carried out to determine whether inclusion of 10% rapeseed meal in the diet of laying hens would increase the thiocyanate content of eggs to a level required by the LP system to promote bactericidal activity in egg products. Such an increase in the thiocyanate content was achieved; future studies will examine the possibility of using the LP system to cold-pasteurize liquid egg products. [See FSTA (1979) 11 2A60.] JA

6

[Egg, milk and soy protein in minced meat products.]
Appelqvist, L. A.; Persson, B.

Var Föda 30 (2) 59-68 (1978) [15 ref. Sv. en] [Inst. för Livsmedelshygien, Sveriges Landbruksuniv., Sweden]

Numerous samples of commercial comminuted meat products (some labelled as containing non-meat proteins) were tested for milk protein, egg protein and soy protein by the double diffusion technique of Ouchterlony [Acta Path. Microbiol. Scand. (1948) 25, 186-191]. The results for detection of egg protein and milk protein were very good (no false positives, and only occasional false negatives). Results for detection of soy protein were relatively poor; studies on 12 products labelled as containing soy protein (at levels of 1.3-9.0%) gave only 3 positive results. Studies with a further 10 samples (containing 1-5% soy protein) gave 4 positive results for non-conc. extracts. Different batches of commercial anti-soy sera all gave a high proportion of false negatives. Problems with serological detection of soy protein in meat products are discussed with reference to literature data. AJDW

7

Dairy products and eggs. Recent developments.

[Book]

Gutcho, M.

Food Technology Review, Noyes Data Corporation
No. 48, xii + 360pp. ISBN 0-8155-0718-6 (1978) [En]
[Noyes Data Corporation, Park Ridge, New Jersey, USA] Price \$39.00

The information in this book is based on US patents issued since January 1976, that deal with dairy products and eggs. Chapters included are: Cheese (pp. 3-106) including starter cultures, coagulating enzymes, coagulation techniques and apparatus, Cottage cheese, Ricotta cheese, Pasta Filata, cheese blocks, cheese slices, other cheesemaking techniques, packaging, flavour, cheese emulsifiers, extenders and substitutes, specialty cheeses, and soy based cheese; Whey (pp. 107-145); Milk (pp. 146-218) including standardized milk, powdered milk, condensed milk, sterilization and preservation of milk, acidified milk gel, and casein;

Yogurt (pp. 219-241) including fermented milk products, shelf-stable yogurt, yogurt makers, and soybean yogurts; Ice cream (pp. 242-262); Whipped toppings and coffee whiteners (pp. 263-287); Margarine (pp. 288-316) including dairy spreads; and Eggs (pp. 317-352) including frozen eggs, modifying cholesterol content, other egg processes, emulsified oil dressings, use of egg white, egg substitutes, extenders and simulated products, and egg white substitutes from whey. Company, inventor and US patent number indexes are included. VJG

8

Nutrient composition of commercially spray-dried egg products.

Cotterill, C. J.; Glauert, J.; Froning, G. W. *Poultry Science* 57 (2) 439-442 (1978) [2 ref. En] [Dep. Food Sci. & Nutr., Univ. of Missouri-Columbia, Columbia, Missouri 65201, USA]

Nutrient composition analyses of 3 commercially spray-dried whole egg, egg white and egg yolk products were conducted. Samples were obtained from industrial sources, pooled, packaged under N₂ atm (except egg white), and stored under refrigeration. Values were obtained for total N, lipid, calories, ash, amino acids, minerals, fatty acids, and vitamins. An equation, whole egg = 0.28 egg white + 0.72 egg yolk, relates the amounts of each component in the 3 products. Prior to this work most data on egg products were adapted from shell egg values. AS

9

Bacterial growth in whole egg and egg substitutes including inoculation with *Staphylococcus aureus* and *Clostridium perfringens*.

Paul, M. E.; Potter, N. N. *Journal of Food Science* 43 (3) 803-806 (1978) [17 ref. En] [Dep. of Food Sci., Cornell Univ., Ithaca, New York 14853, USA]

Bacterial growth patterns in fresh and pasteurized liquid egg and 2 commercially produced egg substitutes were similar. Total aerobic, anaerobic, proteolytic and lipolytic populations of the products' normal flora along with pH, titratable acidity and free fatty acid levels were determined at 2° C and 12° C over periods of ≤ 28 days at the lower temp. Bacterial populations increased substantially in all products except fresh and pasteurized egg at 2° C. Decreases in pH and increases in titratable acidity and free fatty acid levels generally paralleled bacterial growth. *S. aureus* and *C. perfringens* inoculated into the egg products in small numbers were outgrown by the natural flora present. *S. aureus* populations increased slightly over a period of about 4 days at 12° C and then tended to decline. *C. perfringens* declined rapidly or did not grow in any of the products at 12°, 20° and 37° C although total anaerobic counts increased considerably. IFT

10

[Examination and evaluation of egg salads.] Zur Untersuchung und Beurteilung von Eiersalaten. Ohlrogge, J.

Archiv für Lebensmittelhygiene 29 (4) 155-157 (1978) [7 ref. De] [Staatliches Veterinäruntersuchungsamt

Stade, Heckenweg 6, 2160 Stade, Federal Republic of Germany]

36 samples of egg salad were examined for egg contents and for *Salmonellae*. The % of egg pieces was 21.1-36.0% in non-packaged products, 12.0-45.3% in packaged products (mean 26.6%). 80% of samples contained > 20.3%. A min. of 25% egg by wt. is proposed, with compulsory declaration of the egg wt. and the production, packaging and sale date of packaged salads. No *Salmonellae* were detected in any sample. RM

11

[Electrosyneresis on Cellogel for immunochemical food analysis. II. Rapid method for identifying soybean protein, whey, casein and egg in food products.] [Lecture]

Flego, R.; Borghese, R.

Bollettino dei Chimici dei Laboratori Provinciali 5 (1) 172-179 (1979) [20 ref. It] [Lab. Chimico Provinciale, Via Colugna 42, 33100 Udine, Italy]

The immunochemical detection of anodic proteins (soy, milk and egg proteins) by electrosyneresis on Cellogel IM sheets is described. The process eliminates or reduces the disadvantages of agarose gel (variation of characteristics with each preparation and use), providing a support with unvarying and reproducible properties. Time of analysis is reduced to about 1 h, and effect of the electric field increases the sensitivity of the Ouchterlony method. [See FSTA (1977) 10 7A406.] [See FSTA (1979) 11 11A776.] RM

12

[Determination of fat in egg products by the modified Gerber method.]

Gallego, R.; Tesedo, A.

Anales de Bromatologia 30 (3/4) 307-313 (1978) [12 ref. Es, en] [Fac. de Ciencias de Valladolid, Spain]

The fat content in egg products was determined by a modified Gerber method, and results compared to those obtained by modified Soxhlet extraction (chloroform:alcohol, 375:25), using regression lines. Tabulated results for 10 samples each showed 5.0-12.4% fat in whole liquid eggs, 18.06 [18.6?] -30.6% in liquid yolk, 38.4-44.8% in powdered whole eggs and 52.24-56.12% in powdered yolks (correlation coeff. with Soxhlet method $r = 0.9969, 0.9905, 0.9983$ and 0.9986 resp). RM

13

[Comparison of methods for determining fat in egg products.]

Gallego, R.; Tesedo, A.

Anales de Bromatologia 30 (3/4) 339-344 (1978) [13 ref. Es, en] [Fac. de Ciencias de Valladolid, Spain]

10 methods for detn. of fat in egg products were compared, using 4 samples each of liquid whole eggs or egg yolks, powdered whole eggs or egg yolks. Tabulated results showed that all the methods were valid. Results, while not identical, showed a large measure of agreement and high correlation. RM

EGG SHELLS

1

Wheat grown on fly ash: high selenium uptake and response when fed to Japanese quail.

Stoewsand, G. S.; Gutenmann, W. H.; Lisk, D. J. *Journal of Agricultural and Food Chemistry* 26 (3) 757-759 (1978) [14 ref. En] [Dep. of Food Sci. & Tech., New York State Agric. Exp. Sta., Geneva, New York 14456, USA]

Winter wheat was grown to maturity on a deep bed of fly ash from a coal-burning electric power plant. The harvested grain was fed as 60% of a complete diet to Japanese quail for 112 days. The wheat grain contained 5.7 p.p.m. (dry wt.) of Se as compared to 0.02 p.p.m. in control wheat grown on soil. The tissues and eggs from the quail fed the fly ash-grown wheat contained greatly elevated levels of residual Se compared to control birds. Eggshell thickness was significantly greater in the birds fed the fly ash-grown wheat. No significant differences were observed in liver microsomal enzyme activities between quail on the fly ash or control wheat rations. AS

2

[Measurement of the breaking strength of hens' eggs.] Beitrag zur Frage der Bruchfestigkeitsmessungen an Hühnereiern.

Ehinger, F.

Archiv für Geflügelkunde 42 (3) 99-105 (1978) [14 ref. De, en, fr, ru] [Lehrstuhl für Kleintierzucht, Univ. Hohenheim, Postfach 106, 7000 Stuttgart 70, Federal Republic of Germany]

Studies on use of the Instron Foodtester 1140 for evaluation of the breaking strength of eggs are described. Test variables included probe speed (0.5-500 mm/min), probe shape (flat, or large or small-radius round surfaced probes), pre-loading of the egg with forces of 0, 0.2, 0.4, 0.6 and 0.8 kN/m² before testing, and egg size. Variables determined included breaking force, total deformation, deformation under forces of 1 and 2 kN/m², test duration and the rate of increase of force applied to the egg. The results show that breaking strength and total deformation were max. at a probe speed of 20 mm/min, and decreased considerably at high probe speeds. The flat probe gave significantly higher breaking strengths but lower deformations than the round probes. Total deformation decreased with increased pre-loading; breaking strength was little affected. Egg size significantly influenced breaking strength, but not deformation. Correlation coeff. between shell strength characteristics are given. It is concluded that the Instron Foodtester 1140 may be used for detn. of the shell strength and deformation of eggs. AJDW

3

The effect of cockle-shell grit, dietary level of calcium and EDTA on eggshell quality and laying performance of crossbred hens.

Karunajeewa, H.

Australian Journal of Experimental Agriculture and Animal Husbandry 18 (94) 667-674 (1978) [25 ref. En] [Dep. of Agric. Werribee, Victoria, Australia]

Groups of White Leghorn × Australorp pullets (22 wk of age at the start of the trial) were used in a 50-wk study on effects of dietary Ca level (3.0, 3.5 or 4.0%), Ca supplement type (ground limestone or cockle-shell grit) and dietary EDTA level (0 or 500 p.p.m.) on laying performance and egg shell quality. Tables of results are given (including data for shell wt., egg sp. gr., shell wt./unit area, and shell roughness). Cockle-shell grit tended to give better shell quality than ground limestone. Increasing the dietary Ca level improved shell quality only when ground limestone was the sole Ca source. Presence of 500 p.p.m. EDTA in the diet impaired shell quality. AJDW

4

The action of sulphanilamide on shell deposition.

Cooke, A. S.

British Poultry Science 19 (3) 267-272 (1978) [14 ref. En] [Monks Wood Exp. Sta., Abbots Ripton, Huntingdon, Cambs., UK]

As part of a programme on egg shell thinning mediated by environmental pollutants, the action of sulphanilamide on egg shell deposition has been studied in the domestic fowl. The length of time that eggs remain in the shell gland was measured; the relative thickness as protoporphyrin pigment concn. for egg shells removed from the shell gland were determined; and egg shell structure was examined using a replica technique. Sulphanilamide appeared to act mainly by reducing the rate of shell deposition; time spent in the shell gland was unaffected. The thickness of shell components was reduced in a roughly proportional manner in thin shells produced during sulphanilamide treatment. It is postulated that other thin shells in which the component layers are all reduced to a similar extent are also the result of a decreased deposition rate. AS

5

The hen's egg: shell fracture under quasi-static and static loading.

Carter, T. C.

British Poultry Science 19 (2) 249-259 (1978) [18 ref. En] [ARC Poultry Res. Cent., King's Buildings, West Mains Road, Edinburgh EH9 3JS, UK]

6

Salmonella serotypes in poultry and their public health significance.

Rao, V. D. P.

Indian Journal of Animal Health 17 (1) 43-46 (1978) [14 ref. En] [Dep. of Microbiol. & Public Health, Coll. of Vet. Sci., G.B. Pant Univ. of Agric. & Tech., Pantnagar-263 145, Uttar Pradesh, India]

Salmonella serotypes were isolated from poultry (525 dead and 228 live birds) and the poultry house environment. The strains (number in brackets) observed are S. typhimurium (6), S. pullorum (2), S. saint-paul (2) from dead birds and S. typhimurium (3) and S. saint-paul (2) from live birds; S. saint-paul (1) was observed in litter and egg shell surface washings. In the dead birds, more isolations were made from intestines (30%) and retained yolk (30%) than from liver and spleen (20%) and ovary (20%). Poultry feed, air and water did not

yield any strains. Younger birds (<8 wk) yielded more strains than older ones. Incidence was highest in summer, followed by winter. CFTRI

7

The hen's egg: shell breakage when two eggs collide. Carter, T. C.

British Poultry Science 19 (3) 373-386 (1978) [14 ref. En] [ARC Poultry Res. Cent., West Mains Road, Edinburgh EH9 3JS, UK]

A theory of egg shell fracture [British Poultry Science (1976) 17, 199-214] is modified to incorporate the subsequent finding that the energy required for egg shell fracture is dependent on shell compression speed at speeds such as may occur during egg-to-egg impact in poultry houses and packing stations. The modified theory was tested by new experimental data. A method which is described enables a designer of cages and egg-handling equipment to predict the incidence of shell fracture during egg-to-egg equatorial impact at any relative velocity, given information about the distribution of the variate X in the population of eggs in question, where $X = (T - \epsilon) / ((MR_s)^{1/2}(T - \epsilon))$ in which R_s , T and ϵ are, resp., the reciprocal of the average shell curvature, the shell thickness and the thickness of the weak inner shell layer, all measured at the equator, M is egg wt. and ϵ is a constant length (about 13 μ m). AS

8

Cost should determine whether limestone or oystershell is added to the calcium-deficient diet of a layer.

Roland, D. A., Sr.

Feedstuffs 50 (52) 19-20 (1978) [7 ref. En] [Dep. of Poultry Sci., Auburn Univ., Auburn, Alabama 36830, USA]

Literature data comparing effects of limestone or oyster shell added to the diet of laying hens on the shell quality of the eggs are discussed; effects of the particle size of the Ca supplement are also considered. Results differ considerably between studies; possible reasons include differences in particle size between the limestone and oyster shell batches compared, and inadequate total Ca levels in some diets. Recommendations for Ca supplementation of the diet of laying hens are discussed. AJDW

9

[Effects of various P and Na contents in laying hen feed on performance and egg shell quality.] Einflüsse verschiedener Phosphor- und Natriumgehalte im Legehennenfutter auf Leistungen und Eischalenqualität. Vogt, H.; Harnisch, S.

Archiv für Geflügelkunde 42 (5) 169-173 (1978) [2 ref. De, en, fr, ru] [Inst. für Kleintierzucht, Bundesforschungsanstalt für Landwirtschaft, Braunschweig-Völkenrode, Celle, Federal Republic of Germany]

Groups of laying hens were used in a feeding trial over the age range 22-68 wk to evaluate effects of various combinations of dietary Na concn. (0.16-0.27%) and P concn. (0.46-0.71%) on laying performance and egg shell quality (% cracked eggs, breaking strength,

shell deformation under compression, shell thickness). Tables of results are given. In general, egg shell quality deteriorated with increasing P content in the diet; this effect could not reliably be prevented by modifying the dietary Na/P ratio. AJDW

10

Influence of variety of rapeseed meal on egg shell membrane coloration in different breeds and strains of chickens.

Darlington, K.; Vogtmann, H.; Robblee, A. R.; Clandinin, D. R.

Archiv für Geflügelkunde 42 (6) 213-215 (1978) [2 ref. En, de, fr, ru] [Dep. of Anim. Sci., Univ. of Alberta, Edmonton, Alberta, Canada]

Croups of Rhode Island Red, White Plymouth Rock and Single Comb White Leghorn (SCWL) laying hens were fed diets containing (i) no rapeseed products; (ii) 1.2% Span rapeseed oil + 6.8% Span rapeseed meal; (iii) 5.0% Span rapeseed meal + 3.0% Span rapeseed; or (iv) 10% Zephyr rapeseed meal, to evaluate effects of rapeseed and rapeseed products in the diet on the incidence and intensity of pink coloration of the shell membrane (scored visually on a 5 point scale). A table of results is given. On diet (i), one of the SCWL strains had significantly more shell membrane coloration than the other groups studied. Diet (ii) gave a considerable increase in shell membrane pigmentation over (i), whereas diet (iii) gave similar results to diet (i). No explanation of the difference between results for (ii) and for (iii) could be given. (iv) gave the highest shell membrane pink coloration score of the diets studied. High levels of pigmentation of the shell membrane may lead to problems with candling, and rejection of affected eggs. AJDW

11

[Studies on the thickness of egg shell and shell membrane in commercial chicks.]

Jeung Key Ha

Korean Journal of Animal Science 20 (3) 220-226 (1978) [19 ref. Ko, en] [Gyeongsang Nat. Univ., Jin Ju, S. Korea]

Differences between thickness of egg shell and egg shell membrane in 800 eggs from commercial chicks (400 Shaver and 400 Hisex) were investigated during a 10 day period in 1976. In eggs from Shaver chicks, no difference was found in egg shell thickness according to age of chicks; however, egg shells became thinner in Hisex chicks eggs as the chicks grew older. Negative correlation coeff. were found between egg shell and egg shell membrane of blunt end, sharp end and middle portion of eggs of Shaver and Hisex chicks. As oviposition time was prolonged from morning to afternoon, egg shell membrane became thinner and egg shell thickness increased. Egg shell thickness increased as the period in the uterus after egg shell formation increased. [From En summ.] SP

12

A scanning electron microscope study of bacterial invasion in hen's egg shell.

Tung, M. A.; Garland, M. R.; Gill, P. K.

Canadian Institute of Food Science and Technology

Journal 12 (1) 16-22 (1979) [24 ref. En, fr] [Dep. of Food Sci., Univ. of British Columbia, Vancouver, British Columbia, Canada V6T 1W5]

Fresh hen's eggs were immersed in a suspension of *Pseudomonas fluorescens*. After 3, 4, 7 and 11 days eggs were removed and shell samples examined by scanning electron microscopy. No bacterial invasion of the shell pores was evident after 3 days exposure to the microorganism, confirming the protective role of the cuticle in closing pores through the calcareous layers. Pores of eggs exposed for 4, 7 and 11 days were infected with *P. fluorescens*. The cuticular barrier was apparently overcome by a digestive process. Invasion of the pores and shell membranes then proceeded very rapidly. Bacteria were found throughout the shell membrane fibre interstices with no particular accumulation at the continuous inner boundary of the inner shell membrane. The appearance of the fibres and the inner boundary was entirely unchanged after infection which suggested an enzymic process was not involved in the breaching of the final barrier protecting the eggs' contents. AS

13

Calcium homeostasis in pullets of two strains selected for differences in eggshell strength. (In 'Proceedings 1978. Cornell Nutrition Conference for Feed Manufacturers' [see FSTA (1979) 11 7A487]) [Lecture]

Combs, G. F., Jr.; Parsons, A. H.
pp. 43-46 (1978) [10 ref. En] [Dep. of Poultry Sci., Cornell Univ., Ithaca, New York, USA]

Cornell strain K pullets were used for selective breeding for high eggshell strength (HES) and low eggshell strength (LES) strains. Results from 2 generations of selective breeding of HES and LES strains show highly significant ($P < 0.0001$) differences in shell strength were achieved after only 1 generation, with LES showing average shell breaking strength of 7.0% less than HES. This difference increased to 11.9% in the second selected generation at the same age. Pullets selected from families representing extremes in divergence in the 2nd generation of HES and LES strains showed remarkable similarity in shell strength parameters to respective strain averages. LES pullets had shell breaking strength 9.4% less than that of HES pullets ($P < 0.0001$). This accompanied significant ($P < 0.05$) differences in absolute shell wt. (6.4%), relative shell wt. (5.9%) and shell thickness (5.2%) in favour of the HES strain. It is concluded that the present studies indicate areas of Ca metabolism in pullets and in laying fowl which are under hereditary control, and that identification of the biochemical bases of these hereditary influences will help identify the physiological bases for the normal variation in eggshell quality. SP

14

The Jaer breed, a local egg laying breed with genetic variation of interest for future breeding.
Kolstad, N.

Meldinger fra Norges Landbrukshogskole 57 (42) 1-19 (1978) [15 ref. En, no] [Inst. for Fjorfe, Norges Landbrukshogskole, As-NLH, Norway]

This paper includes details of studies on the shell quality of eggs laid by hens of 2 lines of the Jaer breed and 4 lines of the White Leghorn breed, and a Jaer \times White Leghorn cross. Data are given for the shell thickness and deformation under a loading of 0.5 kg. The results show that eggs laid by Jaer hens have significantly thicker shells and lower deformation values than those laid by White Leghorn hens. Values for eggs laid by the crossbred hens were intermediate, but did not differ significantly from those for the purebred Jaer group. The potential for use of the Jaer in breeding programmes for improved egg quality is discussed. AJDW

15

The hen's egg: fracture of shells loaded very slowly.
Carter, T. C.

British Poultry Science 19 (5) 669-679 (1978) [7 ref. En] [ARC Poultry Res. Cent., King's Buildings, West Mains Road, Edinburgh EH9 3J, UK]

Experiments designed to explore the relationships between force at fracture, loading rate, delay before fracture and shell characteristics, using eggs loaded across the equator at very low rates of loading, are reported. Eggs were loaded at the equator, the load on each egg increasing at a constant, low rate dW/dt in the range from 8.7 to 0.39 g/s. When loading continued until shell failure the mean value of the force at failure, P_f , decreased as the loading rate decreased. Among eggs from a given population the mean value of the product $P_f R_s$ was related to $\log e (dW/dt)$ in a linear manner, where R_s is the reciprocal of the average curvature of the shell at the point of application of the load. When loading had been halted shortly before the expected time of failure, delayed failure was observed in more than a quarter of the eggs. The more closely the load approximated to the expected load at failure, the shorter the delay in eggs showing delayed failure. There is a risk of loss of eggs through delayed shell fracture if they are stored in stacks of trays that permit some of them to bear loads that are not large enough to cause immediate fracture but are nevertheless fairly large. AS

16

Laboratory measurements of eggshell strength. I. An instrument for measuring shell strength by quasi-static compression, puncture, and non-destructive deformation.

Voisey, P. W.; Macdonald, D. C.

Poultry Science 57 (4) 860-869 (1978) [21 ref. En] [Eng. Res. Service, Res. Branch, Agric. Canada, Ottawa, Ontario, Canada]

A new eggshell strength testing apparatus is reported, designed to meet known requirements. The apparatus is compact, portable and can test ≥ 180 eggs/h using either the compression, puncture, or non-destructive deformation methods of measuring shell strength. The puncture or compression tests can be combined with the deformation test in operation. The equipment operates semi-automatically using 2 operators, 1 to load and test the eggs and the 2nd to record the data. Critical performance aspects were examined, and the results demonstrate that the

apparatus applies closely controlled test conditions and that the recording equipment registers force and deformation precisely. AS

17

[Study of pore size of egg shell.]

Zakharenko, V. A.; Knyazev, Yu. R.; Obolenskii, V. S.
Izvestiya Vysshikh Uchebnykh Zavedenii, Pishchevaya Tekhnologiya No. 6, 139-143 (1978)
[3 ref. Ru] [Khar'kovskii Inst. Obshchestvennogo Pitaniya, Khar'kov, USSR]

A method of computing total and differential porosity of egg shell is described, based on the principle of penetration of an inert liquid (kerosene) through the eggs shell capillaries and pores. The pattern of pore distribution along the radius is not constant, but is governed by egg topography, hen breed, and other factors. The pore distribution in the shell is of a discrete character, i.e. some sizes of pore radii are absent. STI

18

Influence of hen dietary calcium and phosphorus on the integrity of the egg shell as it would influence hatching success and the consequences of preincubation 2,4,5-T spraying with and without a high TCDD level.

Somers, J. D.; Moran, E. T., Jr.; Reinhart, B. S.
Bulletin of Environmental Contamination and Toxicology 19 (6) 648-654 (1978) [15 ref. En] [Dep. of Anim. & Poultry Sci., Univ. of Guelph, Guelph, Ontario N1G 2W1, Canada]

Commercial strain laying hens were fed practical rations deficient in Ca and/or P to affect weak shelled eggs. During the course of the investigations it was shown that there was an increased porosity estimate when Ca alone was low but not when it was accompanied by a reduced P level. Readily measurable changes in egg shell quality resulted. Analyses for 2,4,5-T residues within the egg after spraying indicate that there were no ready differences in concn. which could have evolved because of hen nutrition. The weakened shell was unaffected as a barrier to herbicide contamination. VJG

EGG WHITES

1

[Foaming properties of concentrated potato juice.] Wojnowska, I.; Bednarski, W.; Poznanski, S.; Leman, J. *Przemysł Spożywczy* 32 (3) 108-111 (1978) [13 ref. Pl, ru, en, fr, de] [Inst. Inżynierii i Biotech. Żywności ART, Olsztyn, Poland]

Potato juice from an Eda centrifuge was centrifuged at 1500 g_n for 15 min to remove starch and concentrated 4:1, 6:1 or 12:1 on vol. by ultrafiltration in an Amicon installation with Hollow Fibre Type HL DP10 membranes for 4-6 h at 20° C. Contents of DM, organic and inorganic substances, total N and N precipitable by 12 % solution of CCl_3COOH are tabulated for the different concentrates and filtrates. Stability and vol. of foam formed in a Komet RG-5 blender was tested in diluted juices, and juices concentrated by ultrafiltration or evaporation (DM range, 0.81-19.02 %); and stabilizing effects of addition of sucrose, or pectin stabilizers (Alginion, Frymulsion or pectin) were studied. It is concluded from tabulated and graphically presented results that temp. > 60° C in evaporation reduced foam stability; that foams produced from ultrafiltration concentrates had a light colour and a pleasant taste; such concentrates with sugar as stabilizer are advocated for bakery and confectionery use as egg white replacers. SKK

2

Process for the preparation of bread.

Akatsuka, S.; Akutsu, S.; Uchida, M. (Eisai Co. Ltd.) *United States Patent* 4 093 748 (1978) [En]

Process is described for preparing bread from a dough composition containing a yeast extract and hydrolysed egg white. Baking time is reduced, and the resulting bread has good qualities and is improved in external appearance, crumb, flavour and compressibility. IFT

3

[Experience with the isolation of salmonellae from foods of different risk categories.] Erfahrungen bei der Isolierung von Salmonellen aus Lebensmitteln unterschiedlicher Risikokategorien. Siems, H.

Zentralblatt für Bakteriologie, Parasitenkunde, Infektionskrankheiten und Hygiene, IB 167 (1/2) 120-128 (1978) [19 ref. De, en] [Inst. für Lebensmittelhygiene, Fleischhygiene & -Tech., Freie Univ. Berlin, Koserstrasse 20, D-1000 Berlin 33]

Studies were conducted on isolation of salmonellae from 355 samples of frozen poultry and 208 samples of pasteurized, frozen or spray-dried egg albumen. 2 direct selective enrichment media were used, dulcitol/selenite (DS) or tetrathionate (T), with or without pre-enrichment in lactose broth (LB), nutrient broth (NB), buffered peptone water (BPW) or tryptone soy broth (TSB). Tables of results are given. Direct selective enrichment media gave positive results for 190 of the frozen poultry samples (74 using T, 87 using DS and 29 using both media). Pre-enrichment procedures gave positive results for only 167 samples, an overall total of

207 Salmonella-positive samples being identified by either or both methods. Of the pre-enrichment media, BPW gave the best results, followed closely by TSB. LB and NB gave considerably lower frequencies of isolation of salmonellae. No salmonellae were isolated from any of the egg product samples. Data are also given for isolation of salmonellae from freeze-dried pancreas powder, used as a raw material for pharmaceutical preparations. AJDW

4

Nutritive deterioration of food proteins due to interaction with oxidized fats. [Lecture]

Sugano, M.; Yanagita, T.

International Congress of Food Science & Technology - Abstracts p.278 (1978) [En] [Dep. of Food Sci. & Tech., Kyushu Univ., Higashi-ku, Fukuoka 812, Japan]

A mixture of egg albumin or casein and ethyl linoleate (2:1, w/w) was incubated at 50° C and 80.4% RH under UV light. The 2 proteins, defatted either before or after incubation, were subjected to various examinations. Browning occurred on the 2nd day of incubation. In vitro digestibility by pepsin and trypsin and available lysine content decreased during incubation; these effects were more marked in albumin than in casein. Extensive damage to basic amino acids occurred in both proteins. Rat feeding trials indicated significant reductions in biological value and true digestibility after incubation. [See FSTA (1979) 11 2A60.] JA

5

Viscometric behaviour of the soluble ovomucin. [Lecture]

Hayakawa, S.; Sato, Y.

International Congress of Food Science & Technology - Abstracts p.169 (1978) [En] [Dep. of Food Sci. & Tech., Nagoya Univ., Furo-cho, Chikusa-ku, Nagoya 464, Japan]

The effects of ions, lysozyme and β -ovomucin on the viscometric behaviour of soluble ovomucin were examined, using a cone plate viscometer for viscosity measurements. The apparent viscosity of the soluble ovomucin decreased on addition of NaCl, CaCl₂ and lysozyme but slightly increased on addition of β -ovomucin. It is suggested that the viscosity of egg white could be greatly increased by removing Na ions and lysozyme. [See FSTA (1979) 11 2A60.] JA

6

Interaction of immobilized chicken flavoprotein with flavins. [Lecture]

Ohtsuki, K.; Kawabata, M.; Taguchi, K.

International Congress of Food Science & Technology - Abstracts p.170 (1978) [En] [Fac. of Living Sci., Kyoto Prefectural Univ., Shimogamo, Kyoto, Japan]

Chemically immobilized flavoproteins of chicken egg white and yolk were studied. They retained approx. 75% of the riboflavin-binding capacity of native flavoproteins, did not lose their reversible

riboflavin-binding capacity, and could also bind lumiflavin and flavin mononucleotide (FMN). [See FSTA (1979) 11 2A60.] JA

7

Effect of heating on the functional properties of ovotransferrin. [Lecture]

Nakamura, R.; Takemoto, H.; Umemura, O.
International Congress of Food Science & Technology - Abstracts p.171 (1978) [En] [Lab. of Food Sci. & Nutr., Fac. of Agric., Tottori Univ., Koyama, Tottori 680, Japan]

The solubility of ovotransferrin, the most heat-labile protein of egg white, was unchanged on heating at pH 8.0-9.5 but decreased during mild heat treatment (65° C for 5 min) in the presence of low NaCl concn.; this decrease was reversed at higher NaCl concn. Similar effects were noticed with many other inorganic salts, but sodium phosphate and citrate had no effect on solubility. The foaming power of ovotransferrin was unaffected by heat alone but decreased on heating in the presence of low NaCl concn. [See FSTA (1979) 11 2A60.] JA

8

Egg albumin polyamines and their reaction with glucose. [Lecture]

Silvestre, M. P. C.; Amaya-Farfan, J.; Sgarbieri, V. C.
International Congress of Food Science & Technology - Abstracts p.215 (1978) [En] [Dep. de Planejamento Alimentar e Nutr., Fac. de Eng. de Alimentos e Agric., 13100 Campinas, Sao Paulo, Brazil]

In connection with the rapid loss of nutritive value of egg albumin during storage with glucose, a study was made of egg albumin polyamines and their possible involvement in this loss. The contents of 3 major polyamines (spermidine, spermine, putrescine) decreased during storage of dialysed lyophilized egg albumin with glucose at 37° C and 68% RH for 30 days. A close relationship was found between total polyamine loss and the decrease in nutritive value. [See FSTA (1979) 11 2A60.] JA

9

[Functional properties of egg white containing added triethyl citrate (TEC).]

Plotka, A.; Schmidt, J.; Radomyski, T.
Przemysł Spożywczy 32 (5) 192-193 (1978) [8 ref. Pl, fr, de, en] [Centralny Ośrodek Badańczo-Rozwojowy Drobiarstwa, Poznań, Poland]

Effect of addition of TEC (0.03%) on the foaming properties of egg white with or without a small (0.2%) yolk component was determined. The TEC substantially improved the foaming properties and stability of foam from frozen egg white restricted to the variant without the yolk component for the spray-dried product. Use of TEC for processing egg white is recommended. AS

10

[Further inspection of the structure of thick egg white.]

Sato, Y.; Hayakawa, S.

Journal of the Agricultural Chemical Society of Japan [Nihon Nogei Kagakkai-shi] 51 (1) 47-51 (1977) [18 ref. Ja, en] [Dep. of Food Sci. & Tech., Fac. of Agric., Nagoya Univ., Furo-cho, Chikusa-ku, Nagoya, Japan]

The structure of thick egg white in relation to the protein composition of its 2 fractions was investigated. The gel fraction, which was separated from the liquid fraction by ultracentrifugation, contained 0.14% insoluble ovomucin, 0.20% soluble ovomucin (estimated figure) and 1.6% lysozyme, while the liquid fraction contained 0.20% soluble ovomucin and 1.3% lysozyme. The composition with respect to other proteins was similar in the 2 fractions, except for the higher content of ovotransferrin and/or ovoglobulin in the gel fraction. The amino acid and carbohydrate compositions of soluble ovomucin and the protein composition of the gel fraction were the same as for thin white, except for the lysozyme content. It was concluded that the structure of thick white was somewhat cyst-like, comprising a thin white portion, (approx. 43%) enclosed by a sac-like structure of the gel fraction (approx. 16%). [From En summ.] JRR

11

Immunological behaviour of some major proteins of fowl's egg white in double gel diffusion patterns.

Goel, V. K.; Joshi, B. C.

Journal of Food Science and Technology, India 15 (3) 108-110 (1978) [8 ref. En] [Indian Vet. Res. Inst., Izatnagar, UP, India]

Native egg albumen and each of its 6 pure fractions were tested immunologically on Duchterlony plates by double gel diffusion against their antisera. A min. of 3 antigenic components were found for conalbumin 1; conalbumin 2, ovomucoid and avidin of the native egg albumen whereas its ovalbumin and lysozyme fractions had 2 such components. Testing of pure proteins also showed the same min. numbers of antigenic components with their respective antisera. Antigenically there is only one type of conalbumin in the egg white although electrophoretically and/or chemically they can be distinguished into ≥ 2 types. However, one antigenic component is common to the major egg proteins except for lysozyme, which apparently is much more specific than the others. CFTRI

12

Egg white foodstuffs.

Kewpie KK

British Patent 1 516 235 (1978) [En]

A coagulated egg white food is described containing (by wt.) 70% coagulated egg, 1-15% of an organic water binding material, 0.1-1.0% of a vegetable gum or carboxy methyl cellulose and 2-15% of a starch hydrolysate. This treatment improves the quality of egg white for frozen storage. IFT

13

The use of zinc as a method of resting laying hens.

Cregger, C. R.

Poultry International 17 (4), 76, 78 (1978) [En, de, it, es, fr]

Resting of laying hens by feeding a diet containing 25 000 p.p.m. Zn for 6-7 days is discussed. Data are

given for Zn concn. in the yolk and albumen before treatment and ≤ 6 days after treatment. The results show that, by the time the bird lays the 1st eggs after dietary Zn levels have returned to normal, there is no excess Zn in the yolk or albumen. AJDW

14

Pulse radiolysis study of egg white. (In 'Food preservation by irradiation' [see FSTA (1979) 11 4G311]) [Lecture]

Micic, O. I.; Josimovic, L.; Markovic, V. I, 385-395 (1978) [11 ref. En] [Boris Kidric Inst. of Nuclear Sci., Belgrade, Yugoslavia]

Radiolytic processes in egg white in intervals of 0.1 μ s to several s were studied by the pulse radiolysis technique. The formation and decay of short-lived intermediates and their absorption spectra were observed under varied experimental conditions. Results show that intermediates are produced predominantly in reactions of radicals formed in water radiolysis with egg white proteins. The intermediates decay mainly in the 1st-order intermolecular processes, though the mechanism of transformations is very complex. AS

15

Instant dissolving egg white.

Bergquist, D. H.; Cunningham, F. E.; Eggleston, R. M. (Henningsen Foods Inc.)

United States Patent 4 115 592 (1978) [En]

Dried egg white particles are spray coated with an aqueous sucrose (40-80%) solution followed by sifting to prevent formation of clumps, and drying to a moisture content 3-6%. The product has improved flow and water solubility characteristics. IFT

16

Iron binding by wheat gluten, soy isolate, zein, albumen and casein.

Nelson, K. J.; Potter, N. N.

Journal of Food Science 44 (1) 104-107, 111 (1979) [15 ref. En] [Dep. of Food Sci., Cornell Univ., Ithaca, New York 14853, USA]

The binding of Fe from FeSO_4 and ferric pyrophosphate by wheat gluten, soy isolate, zein, albumen and casein was determined in aqueous dispersions over the pH range 4-10 and at temp. and times up to 87°C and 180 min. Under many of the experimental conditions > 50% of the 20 mg Fe added/g protein became bound to the insoluble fraction of the various proteins. Lesser amounts were bound by the soluble fraction. Fe distributions between precipitated protein, soluble protein and ultrafiltrates of soluble protein were influenced by Fe source, protein source, pH, temp. and time. IFT

17

[Effect of egg storage conditions on changes in electrophoretic patterns of proteins.]

Trziszka, T.; Smolinska, T.

Przemysł Spożywczy 32 (6) 225-227 (1978) [17 ref. Pl, ru, en, fr, de] [Zakład Tech. Surowców Zwierzęcych, Inst. Przechowywania i Tech. Żywności, AR, Wrocław, Poland]

(i) 80 Leghorn eggs (wt. 55-60 g) collected over 4 days in a small poultry farm with 60 layers, and (ii) 80 such eggs from a large commercial farm with 3000 layers were stored for ≤ 60 days at $20 \pm 2^\circ\text{C}$ and $72 \pm 3\%$ RH, and 10-egg (i) and (ii) samples were examined initially (a few h after laying) and after storage for 10, 20, 30, 40, 50 and 60 days. Individual 0.2 ml egg white samples were fractionated by polyacrylamide gel electrophoresis; egg freshness was assessed in terms of Haugh units until the 50th day. It is concluded from electropherograms presented that 12 protein fractions were present initially; that globulin fractions began to disappear progressively after 30 days; and that changes on ovomucoid, ovalbumin and conalbumin fractions became noticeable at 50-60 days; no difference was found in these respects between (i) and (ii). However, tabulated data on freshness assessment show significantly ($P < 0.05$) better freshness of (i) eggs after storage for 30 and 40 days. SKK

18

[Egg white as an extraneous protein in comminuted meat.]

Haave, I.-J. J.

Norsk Veterinærtidsskrift 89 (12) 815-816 (1977) [No] [Afdeling for Kjott & Naeringsmiddelkontroll, Helseseksjon, Bergen, Norway]

A case in which adulteration of comminuted meat with egg white was detected is described. Adulteration was suspected on the basis of the soft-sticky consistency of the sample. The sample was checked for presence of egg white proteins by gel electrophoresis, after extraction of proteins soluble in physiological saline. Comparison of the electropherogram of the sample under test with those of egg white, minced meat (without added egg white) or meat/egg white blends confirmed that the sample under test contained added egg white. It is emphasized that egg white can only be detected by this method in raw samples. AJDW

19

Viscometric behaviour of the soluble ovomucin.

Hayakawa, S.; Sato, Y.

Agricultural and Biological Chemistry 42 (11) 2025-2029 (1978) [20 ref. En] [Lab. of Food Sci. & Tech., Fac. of Agric., Nagoya Univ., Chikusa, Nagoya, Japan]

The effects of several factors (concn., pH, etc.) on viscosity of soluble ovomucin solutions were studied. Thick egg white was ultracentrifugally separated into liquid and gel fractions; soluble ovomucin was prepared from the liquid, and insoluble ovomucin from the gel fraction. Apparent viscosities determined by a cone-plate viscometer were (cP) thick white 15, liquid fraction 5, 0.15% soluble ovomucin 4.6, 0.15% insoluble ovomucin 18.0. Apparent viscosity of soluble ovomucin showed a sharp rise at concn. > 1.5 mg/ml; apparent viscosity of 2-2.5 mg/ml solutions was comparable with that of 1.5 mg insoluble ovomucin/ml. Apparent viscosity of soluble ovomucin solutions decreased with increase of pH at pH > 6. Increase of NaCl concn. decreased apparent viscosity to a min. at 100mm NaCl, with a slight increase to 120mm NaCl and no apparent change at higher NaCl concn. Addition of 1 mg

lysozyme/ml to solutions of ovomucin decreased apparent viscosity. Addition of CaCl_2 at $> 2\text{mM}$ decreased apparent viscosity of soluble ovomucin solutions; presence of sonicated β -ovomucin reversed this effect at 4–6 mM CaCl_2 , where viscosity increased, but at higher CaCl_2 concn. viscosity decreased to original levels (without β -ovomucin). Soluble ovomucin concn. in liquid fraction of thick egg white is 0.2%; it is suggested that viscosity of 0.2% ovomucin solution is higher than that of liquid egg white fraction because of the presence of 70–80 mM Na and 3–4 mg lysozyme/ml in egg white. Removal of these may increase egg white viscosity. DIH

20

Effect of the Maillard reaction on the attributes of egg white proteins.

Kato, Y.; Watanabe, K.; Sato, Y.

Agricultural and Biological Chemistry 42 (12) 2233–2237 (1978) [15 ref. En] [Women's Coll. of Tokaigakuen, Tenpaku-ku, Nagoya 468, Japan]

Eggs white solids freeze-dried with or without the addition of glucose were stored at 50°C under 65% RH to study the effect of the Maillard reaction on the solubility and heat stability and the formation of aggregates. A stimulative effect on the former properties was observed on the sample with glucose in the initial stage of the Maillard reaction. By comparing the sodium dodecyl sulphate (SDS)-polyacrylamide gel electrophoretic patterns, solubilities in SDS and SDS/2-mercaptoethanol and the $s_{20,w}$ values, it was found that glucose, in addition to the effect due to the changes of charged groups in glucose-protein complex occurring in the course of the Maillard reaction, might have a protective effect against aggregate formation through a stable cross-linking, which was not dependent on the SS bond, and through a stable non-covalent bond. AS

21

Comparison of the abilities of trichloroacetic, picric, sulfosalicylic, and tungstic acids to precipitate protein hydrolysates and proteins.

Greenberg, N. A.; Shipe, W. F.

Journal of Food Science 44 (3) 735–737 (1979) [En] [Dep. of Food Sci., Cornell Univ., Ithaca, New York 14853, USA]

The abilities of picric, sulphosalicylic (SSA), trichloroacetic (TCA), and tungstic acids to precipitate a partial hydrolysate of egg albumen and several proteins were examined. After precipitation of the hydrolysate with SSA, TCA, and tungstic acid resp., it was found that 88%, 79%, and 69% of the N remained in solution. The average size of peptides in supernatants varied from 330 to 380 dalton. The ability to precipitate native proteins varied with precipitant and protein. Tungstic acid precipitated both bovine serum albumin and β -lactoglobulin completely at low concn. (0.5% final concn., w/v). Bovine serum albumin was precipitated by 3% TCA or SSA but, β -lactoglobulin was not completely precipitated until concn. had been increased to 10% and 20%, resp. Pretreating β -lactoglobulin with sodium dodecylsulphate increased the amount precipitated by SSA and TCA. IFT

22

[Sensory evaluation of textural properties of gelatin, agar-agar and egg-white gels.]

Toda, J.; Wada, T.; Konno, A.

Journal of the Agricultural Chemical Society of Japan [Nihon Nogei Kagakkai-shi] 52 (11) 539–544 (1978) [7 ref. Ja, en] [Food Res. Lab., Takeda Chem. Ind. Ltd., Osaka, Japan]

Textural characteristics of gel foodstuffs were evaluated using eight 7-point sensory scales corresponding to fundamental textural properties. The scales could be classified as (i) useful for describing differences between gels formed by the same agent, (ii) useful for differentiating between gels of different gelling agents or (iii), both (i) and (ii). Sensory 'hardness' was highly correlated with Texturometer hardness, following Fechner's logarithmic law, and also with breaking strength. Sensory 'brittleness' and 'springiness' were correlated with deformation at the breaking point. Instrumental parameters which correlate with the sensory parameters in category (ii) could not be found for the subjects studied. It is concluded that sensory evaluation under controlled conditions is a valid and useful method for textural characterization of gel foods. [From En summ.] JRR

23

[Fried potato product.]

Nisshin Oil Mills Co. Ltd.

Japanese Examined Patent 5 346 898 (1978) [Ja]

A mashed potato dough product containing added soy protein, egg white and polysaccharide is moulded and fried to yield a product having excellent texture and flavour. IFT

24

Frozen egg white product.

Iimura, O. (Kewpie Co. Ltd.)

United States Patent 4 138 507 (1979) [En]

A freeze-thaw stable, heat coagulated, frozen egg white food product is described which contains $\geq 70\%$ by wt. coagulated egg white, together with minor quantities of a water-combinable material, a viscosity increasing agent, and a starch hydrolysate. IFT

25

Some behaviors of enterococci isolated from dried egg whites.

Imai, C.

Poultry Science 57 (1) 134–141 (1978) [14 ref. En] [Lab. of Q. P. Corp., Sengawa-cho, Chofu-shi, Tokyo 182, Japan]

The distribution of enterococci in various dried egg white (DEW) products was surveyed, and behaviour of enterococci during the manufacturing process of DEW was studied. From some DEW samples, enterococci including *Streptococcus faecalis*, *S. faecalis* var. *liquefaciens*, and *S. faecium* were identified, but *S. durans* was not detected. These 3 spp. of *Enterococcus* did not grow in yolk-free egg white, but grew well in egg white containing small quantities of egg yolk. Counts of these enterococci were hardly

decreased by pasteurization under various conditions, including Cunningham and Lineweaver's method. In desugaring by glucose oxidase, these enterococci perished, but in yeast or bacterial fermentation of yolk-free egg white, the counts of these enterococci hardly changed. Small counts of presumable enterococci perished in spontaneous fermentation of yolk-free egg white, but they increased rapidly in fermentation of egg white containing 0.15% yolk. Counts of these enterococci were decreased considerably by spray-drying egg white, but hardly changed by pan-drying. In the heat treatments of dried powder at 57°C and of dried crystal at 50°C, many days were needed for destruction of these enterococci. AS

26

[The nutritional value of frozen foods.]

Travia, L.

Rivista della Societa Italiana di Scienza dell'Alimentazione 8 (1) 9-16 (1979) [10 ref. It, en] [Istituto di Sci. dell'Alimentazione, Fac. di Med. & Chirurgia, Univ. di Roma, Rome, Italy]

After an initial discussion of the history and applications of frozen storage of foods, studies on effects of freezing, frozen storage and repeated freeze/thaw cycles on the nutritional value of various foods are described. Tables of data are given. The results show freezing to have little or no effect on the crystallization properties of equine serum albumin, or the crystallization characteristics and total N and tryptophan contents of egg albumen. The concn. and characteristics of lipid fractions of sardines (*Sardinia pilchardus*) were influenced by freezing, frozen storage and repeated freezing/thawing treatments; however, the changes were of limited significance for the nutritional value of the product. Overall, it is concluded that frozen storage has little effect on the nutritional value of foods. AJDW

27

Selected studies in thermal processes applied to biological systems.

Ling, A. C.-C.

Dissertation Abstracts International, B 38 (11) 5262: Order no. 78-02967, 197pp. (1978) [En] [Univ. of Wisconsin, Madison, Wisconsin 53706, USA]

In the 1st study, a double-tube heat exchanger (consisting of an electrically-heated stainless steel section located on the centre-axis of a glass pipe) was used to study the fouling of heat exchange surfaces by biological fluids, fouling being initiated by continuously circulating a test solution through the annular passage of the heat exchanger. Experimental results with dil. egg albumin solution indicated that: fouling rate increased with increasing heat exchange surface temp.; fouling rate was not significantly affected by increasing fluid flow rate; fouling rate increased with decreasing fluid temp.; fouling rate increased with increasing protein concn.; mechanical surface finishes did not affect fouling; and coating with fluorocarbon polymer prevented scale formation. In the 2nd study, a method was developed for estimating the surface heat transfer

coeff. in the presence of non-condensable gases. In the 3rd study, a simple 2-fraction model is proposed for describing the kinetics of thermal inactivation of enzyme systems containing heat-resistant and heat-labile isozymes. Using this model, kinetic parameters for thermal destruction of the isozymes may be estimated directly from thermal treatment data. JA

28

Technical note: selected functional properties of a whey protein isolate.

Burgess, K. J.; Kelly, J.

Journal of Food Technology 14 (3) 325-329 (1979) [14 ref. En] [An Foras Taluntais, Moorepark Res. Cent., Fermoy, Co Cork, Irish Republic]

Properties of whey protein isolate (WPI) obtained using regenerated ion exchange cellulose [FSTA (1978) 10 1P3] were compared with those of whey protein concentrate (WPC) obtained by ultrafiltration, and fresh egg white (EW). Protein solubility of WPC and EW was always > 90% at pH 3.0 to 8.0 whilst that of WPI fell to 35% around the isoelectric point (pH 4.5). WPI had a lower gelation temp. than that of EW or WPC (56-58°C vs. 60°C and 67-74°C resp.), and excellent water-holding capacity, similar to that of EW. Specific foam value (ml/g) and drainage at 30 min (ml) resp. were 10.2 and 8 for WPI, 10.0 and 12 for EW, 2.5 and 100 for WPC, 3.1 and 4 for 100 g WPI + 100 g sucrose, and 3.5 and 2 for 100 g EW + 100 g sucrose. Results show the potential of WPI as a replacement for EW in certain foods. CDP

29

[Effect of various technical treatments on the quality of industrial egg-white.]

Thapon, J.-L.; Brule, G.; Fauquant, J.; Thireau, M.

Industries Alimentaires et Agricoles 96 (3) 263-276 (1979) [34 ref. Fr, en] [INRA, 65 rue Saint Brieuc, 35042 Rennes, France]

The effects of physical and chemical treatments (ultrafiltration, homogenization, acidification, heat treatment, addition of ovomucin, Na salts and/or sucrose) on the viscosity of egg white, its functional properties (foam density and stability) and bacteriological quality (total and coliform counts) were investigated. Results, shown graphically and in tables, revealed that functional properties were improved by increasing protein concn. by ultrafiltration, homogenizing to a viscosity around 3 cP, acidifying by lactic fermentation to about pH 7, addition of Na salts (mainly pyro- and hexametaphosphate) or addition of ovomucin. Combined action of Na salts (and/or sucrose) and heat treatment (62-63°C, 30 min) improved the functional and bacteriological quality, e.g. 30 min at 63°C with 20% sucrose, 10% NaCl reduced total count from 98 000 to 200, coliform count from 200 to 0. RM

30

[Authorization for use of aluminium salts in pasteurization of egg white.]

Italy, Ministro della Sanita

Industria Conserve 54 (1) 77 (1979) [It]

The ministerial ordinance of 11th Oct. 1978 is supplemented by the ministerial decree of 13th Dec. 1978 (Official Gazette No. 351, 18.12.1978, p. 9036) authorizing the use of $\text{Al}_2(\text{SO}_4)_3 \cdot 18\text{H}_2\text{O}$ or $\text{AlNH}_4(\text{SO}_4)_2 \cdot 12\text{H}_2\text{O}$ for pasteurization of egg white at 300 g/1000 l. egg white. Purity specifications for the 2 salts are tabulated. RM

EGG YOLKS

1

Effects of varied zinc/copper ratios on egg and plasma cholesterol level in White Leghorn hens. Helwig, L. R., Jr.; Mulnix, E. J.; Regenstein, J. M. *Journal of Food Science* 43 (3) 666-669 (1978) [22 ref. En] [Dep. of Poultry Sci., Cornell Univ., Ithaca, New York 14853, USA]

In order to test the hypothesis that the Zn:Cu ratio is an important factor in determining the plasma level of cholesterol [Klevay, L. M. *American Journal of Clinical Nutrition* (1973) 26, 1060-1068], White Leghorn laying hens were fed normal energy (2764 kcal/kg) and low energy (2470 kcal/kg) practical diets containing varied Zn:Cu ratios. The levels of Zn and Cu used were selected such that neither was nutritionally limiting nor toxic. No significant differences were observed between the control diet (fed for 4 wk before commencing the actual experiment) or any of the experimental diets, with the cholesterol levels averaging 13.3 mg/g for egg yolk and 84.1 mg/g for the plasma samples. IFT

2

Lowering of water activity accompanying emulsion formation. [Lecture]

Koiwa, Y.; Ohta, S.

International Congress of Food Science & Technology - Abstracts p.209 (1978) [En] [Kyowa Hakko Kogyo Co. Ltd., Tokyo Res. Lab., Machida, Tokyo 194, Japan]

In an emulsion system composed of egg yolk, water, NaCl and soybean oil a positive correlation was found between the degree of emulsification and water activity reduction; i.e. the water activity of the emulsion decreased as emulsification proceeded. Physicochemical studies indicated that water molecules became structured at the oil/water interface. [See FSTA (1979) 11 2A60.] JA

3

Chemical characterization of egg yolk myelin figures and low-density lipoproteins isolated from egg yolk granules.

Garland, T. D.; Powrie, W. D.

Journal of Food Science 43 (4) 1210-1214 (1978) [22 ref. En] [Dep. of Food Sci., Univ. of British Columbia, Vancouver, British Columbia, Canada]

Myelin figures (MF) and low-density lipoprotein (LDLg) in yolk granules were isolated from the subpellicle fraction formed during the super-centrifugation of a granule dispersion in 10% NaCl [see FSTA (1978) 10 10Q116]. The MF and LDLg fraction were analysed for total N, total P, total lipid, cholesterol and phospholipids. MF fraction possessed components similar to those for LDLg, but concn. were different. MF contained about 86% lipid and LDLg about 84%. Amount of total N in the 2 fractions was dependent on the age of hens from which eggs were obtained. With eggs from 36-wk-old hens, the MF and LDLg fractions had % total N values of 1.29 and 1.82, resp., whereas with hens from 39 wk to 1.5 yr of age, total N values were 2.39-2.52% for MF

and 2.46-2.51% for LDLg. Total P content of the LDLg fraction was dependent on hen age. As a proportion of the total lipid, MF fractions were found to be rich in cholesterol, about 11.5%, whereas LDLg fraction contained about 3.7%. Total phospholipid content of MF and LDLg from eggs of 39-wk-old hens was approx. 30 and 26%, resp. Phosphatidyl choline was the predominant phospholipid in both MF and LDLg, and small amounts of phosphatidyl ethanolamine, lysophosphatidyl ethanolamine and sphingomyelin were present. IFT

4

Freeze-thaw gelation of yolk lipoprotein. [Lecture] Kurisaki, J.; Yamauchi, K.; Kaminogawa, S. *International Congress of Food Science & Technology - Abstracts* p.168 (1978) [En] [Dep. of Agric. Chem., Univ. of Tokyo, Bunkyo-ku, Tokyo 113, Japan]

The gelation of egg yolk after freezing and thawing is attributed to the aggregation of the major yolk lipoprotein, very low density lipoprotein (VLDL). A study was made of the surface organization of a VLDL particle and the structural damage to the surface during freezing and thawing of VLDL. The results support the hypothesis that, during freezing and thawing, the VLDL particles lose their surface components and aggregate together. The mechanism of destruction of the surface layer is still obscure. [See FSTA (1979) 11 2A60.] JA

5

Effect of dietary oil, cholesterol, and soysterols on the lipid concentration and fatty acid composition of egg yolk, liver and serum of laying hens.

Sim, J. S.; Bragg, D. B.

Poultry Science 57 (2) 466-472 (1978) [38 ref. En] [Dep. Anim. Sci., Univ. of British Columbia, Vancouver, British Columbia V6T 1W5, Canada]

White Leghorn laying hens at 30 wk of age were fed a basal diet containing 8% hydrogenated coconut oil (HCO) or 8% safflower oil (SO), with or without supplementary cholesterol (1%) and/or soy sterols (2%). Highest concn. of lipids in egg yolk were found in SO + soy sterols and lowest in SO + cholesterol (295.0 and 276.5 mg/g wet yolk, resp.). Both HCO and SO altered the fatty acid composition of the yolk lipids, by increasing the concn. of oleic acid and reducing the concn. of palmitic and/or stearic acids. Data are also given on the hens' liver and blood serum. HBr

6

Studies on comparative utilization of xanthophylls from various natural sources for egg-yolk pigmentation.

Chandra, S.; Netke, S. P.; Gupta, B. S.

Indian Journal of Animal Sciences 48 (6) 456-460 (1978) [6 ref. En] [Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jubalpur 482 001, India]

50 White Leghorn crossbred hens, 15-18 months of age, were used in a study on effects of dietary xanthophyll sources on the pigmentation of the egg yolk. Dietary xanthophyll sources studied included marigold (*Tagetes erecta*) petal meal at $\leq 0.75\%$ in the

diet: berseem (*Trifolium alexandrinum*) meal at $\leq 10.20\%$, orange peel meal at $\leq 10.20\%$, grass meal at $\leq 6.51\%$, paprika meal at $\leq 3.24\%$, yellow corn meal at $\leq 14.60\%$, grass meal (shade-dried, sun-dried or oven-dried) at 4.34% in the diet, or the saponified ether extract of shade-dried grass meal, at a level equivalent to 4.34% shade-dried grass meal in the diet. Tables of results are given, including data for the xanthophyll content and Roche colour fan numbers of the yolks, and the efficiency of xanthophyll deposition. The results show that efficiency of xanthophyll deposition decreases with increasing xanthophyll level in the feed; this complicates comparison of the relative values of the materials tested for pigmentation of egg yolks. Trends in relative yolk pigmenting capacities of the feed additives are, however, considered. Roche colour fan number was not closely related to xanthophyll concn. in the yolk; this is discussed with reference to the likelihood that pigments other than xanthophyll contribute to yolk colour. AJDW

7

[Effect of unsaturated fatty acid on the fatty acid distribution in triglycerides of egg yolk lipids.] Sekizaki, H.; Katsuki, T.

Japanese Journal of Zootechnical Science [Nihon Chikusan Gakkai-ho] 49 (8) 556-565 (1978) [Ja, en] [Dep. of Anim. Nutr., Nippon Vet. & Zootech. Coll., Mushashino-shi, Tokyo 180, Japan]

Effects of feeding diets containing safflower oil, linseed oil, or tallow fat to laying hens on the distribution of fatty acids in egg yolk triglycerides were analysed. Results, presented in tabulated form, are discussed. [From En summ.] SP

8

Direct substitution of maize with sorghum in layer diets.

Syed Ali, A. B.; Yeong, S. W.

Malaysian Agricultural Journal 51 (1) 50-53 (1977) [5 ref. En] [MARDI, Serdang, Selangor, Malaysia]

Direct substitution of up to 60% maize in the layer diet of 180 White Leghorn cross pullets by 0, 20, 40 or 60% sorghum for 40 wk resulted in no significant differences in egg wt, % egg production, feed conversion efficiency and mortality. High sorghum rations were associated with paler egg yolk colour, but this could be remedied by supplementing the rations with artificial xanthophyll or carotenoid. AL

9

[Enzymic determination of sugars in ice cream.]

Cantafora, A.; Villalobos, D. A.; Rodini, R.

Rivista della Societa Italiana di Scienza dell'Alimentazione 7 (2) 131-134 (1978) [7 ref. It] [Lab. Alimenti, Istituto Superiore di Sanita, Rome, Italy]

Enzymic methods proposed in the EEC for determination of sugars in ice cream, based on techniques described by Bergmeyer [Methoden der enzymatischen Analyse, Verlag Chemie, Weinheim, Federal Republic of Germany, 1970], were tested for accuracy and possible interference between the sugars or from other ingredients. The methods were applied

for determination of pairs of sugars (sucrose/glucose, glucose/fructose, lactose/galactose), using commercial kits based on the procedures recommended by the Dutch Food Inspection Service. In each case a fat-free, protein-free extract of the ice cream was prepared. Glucose was converted to glucose-6-phosphate, which together with NADP was oxidized to gluconate-6-phosphate + NADPH. The NADPH, which corresponded to the amount of glucose initially present, was then determined by its absorption at 340 nm. The other sugars were determined by similar techniques. Tests on samples prepared in the laboratory showed little interference between sugars, but sucrose determination was affected by presence of egg yolk and other ingredients, which made the results $1-2\%$ too high. Reproducibility (coeff. of variation of results) was 3.9% for sucrose in presence of glucose, 3.4% vice versa, 3% for glucose in presence of fructose, 2.7% vice versa, and 2.8% for lactose in presence of galactose. Recoveries were satisfactory in all cases. ADL

10

Preparation of lipid-free protein extracts of egg yolk.

Meslar, H. W.; White, H. B., III

Analytical Biochemistry 91 (1) 75-81 (1978) [15 ref. En] [Dep. of Chem., Univ. of Delaware, Newark, Delaware 19711, USA]

1-butanol extraction of chicken egg yolk homogenates containing 1M NaCl yields lipid-free aqueous solutions of egg yolk proteins. These solutions, after dialysis, can be applied to a variety of chromatographic media without clogging. Although some proteins are denatured by this procedure, most of the water-soluble proteins remain in solution, including biotin-binding protein and riboflavin-binding protein. AS

11

Yolk color characteristics, xanthophyll availability and a model system for predicting egg yolk color using β -apo-8'-carotenal and canthaxanthin.

Fletcher, D. L.; Harms, R. H.; Janky, D. M.

Poultry Science 57 (3) 624-629 (1978) [9 ref. En] [Dep. Poultry Sci., Florida Agric. Exp. Sta., Gainesville, Florida 32611, USA]

The egg yolk pigmenting ability of β -apo-8'-carotenal and canthaxanthin was evaluated using reflectance colorimetry to both describe the colour and determine relative biological availability. Laying hens, previously depleted of xanthophylls, were fed diets containing 0, 22, 44, 88, or 17.6 mg/kg of each of the 2 xanthophylls, in a 5×5 factorial arrangement of treatments. The yolk colour was evaluated for the Y CIE values of dominant wavelength (DWL), excitation purity (EP), and luminosity (Lum) when undiluted or diluted with a white diluent for each treatment. Selected treatment combinations of egg yolks were blended and also evaluated undiluted and diluted. DWL increased from 572.8 nm for the 0 level to 577.9 and 590.6 nm for the 17.6 mg/kg levels of β -apo-8'-carotenal and canthaxanthin, resp. Analysis of the diluted EP values indicated that β -apo-8'-carotenal was 82.2% as available as canthaxanthin while the pigmentation efficiency of β -apo-8'-carotenal was 92.1% that of

canthaxanthin. Blended samples yielded similar colour scores when compared at the same level of xanthophyll concn. as fed. From these data a model was formulated from which yolk colour could be predicted from the feed concn. of these 2 xanthophylls. It is suggested that egg yolks of a desired colour could be obtained by using the model to predict either the feed concn. of the 2 test xanthophylls required in the diet or by blending yolks produced from feeds with known xanthophyll concn. AS

12

Transfer of ^{125}I to eggs in hens fed on diets containing high- and low-glucosinolate rapeseed meals.

Goh, Y. K.; Clandinin, D. R.

British Poultry Science 18 (6) 705-710 (1977) [10 ref. En] [Dep. of Anim. Sci., Univ. of Alberta, Edmonton, Alberta T6G 2E3, Canada]

An experiment was designed to evaluate the effect of the glucosinolate content of rapeseed meal on the transfer of dietary I to eggs. The experimental diets, containing 2 concn. (50 or 100 g/kg) of high- or low-glucosinolate rapeseed meal, and a diet, devoid of rapeseed meal, all supplemented with 0.3 mg I/kg, were given to laying hens for 6 wk before oral administration of ^{125}I daily for 11 days. The % of ^{125}I transferred to egg yolk was significantly reduced by the inclusion of high-glucosinolate rapeseed meal, but not by low-glucosinolate meal. Detn. of the total I content of egg yolk indicated some reduction in the transfer of dietary I to eggs even with the low-glucosinolate rapeseed meal. AS

13

The performance of cross-bred hens given free choice feeding of whole grains and a concentrate mixture and the influence of source of xanthophylls on yolk colour.

Karunajeewa, H.

British Poultry Science 19 (6) 699-708 (1978) [16 ref. En] [Dep. of Agric., Anim. Res. Inst., Werribee, Victoria 3030, Australia]

Cross-bred hens were offered, from 25 to 73 wk of age, diets based on either wheat or barley in the form of either a mash or as whole grains plus a concentrate mixture. 4 sources of xanthophylls were also compared. Barley diets reduced ($P < 0.01$) egg yolk colour only during the 25 to 49 wk-of-age period. In the same period, hens receiving the whole grains plus concentrate laid eggs with lower ($P < 0.01$) yolk colour scores than those given the mash diets. Egg sp. gr. and Haugh unit scores were not significantly affected by the dietary treatments. Hens fed on diets with lucerne meal plus the mixture of yellow and red xanthophylls produced eggs with the highest yolk colour scores, and the lowest yolk colour scores were produced by the hens given the diets with lucerne meal as the only source of xanthophyll pigments. Hens fed on diets with lucerne meal and either (i) canthaxanthin or (ii) citranaxanthin produced eggs with yolk colour scores that were intermediate to the other 2 groups with (i) giving a higher colour score than (ii). During the second half of the laying period yolk colour scores were higher

than during the first half of the laying period. A significant ($P < 0.01$) cereals \times pigment sources interaction during the 25 to 49 wk-of-age period occurred. Hens fed on barley diets supplemented with the synthetic pigments, compared with those fed on the wheat diets, produced eggs with lower yolk colour scores. The cereals had no effect on yolk colour when the basal diets with lucerne meal as the only source of xanthophyll were given. Either (i) or (ii) or β -apo-8'-carotenoic acid ethyl ester plus (i) in diets containing lucerne meal produced eggs with acceptable yolk colours. VJG

14

Effect of dietary fiber on egg yolk, liver, and plasma cholesterol concentrations of the laying hen.

McNaughton, J. L.

Journal of Nutrition 108 (11) 1842-1848 (1978) [26 ref. En] [USDA, SEA, FR, South Cent. Poultry Res. Lab., Mississippi 39762, USA]

A total of 792 White Leghorn hens was used in studies on effects of dietary fibre level (2.05-8.79%) and dietary fibre source (alfalfa meal, ground whole oats, sunflower meal, rice mill feed, wood shavings, or fibre naturally present in the basal corn/soybean meal diet) on plasma, liver and egg yolk cholesterol concn. and egg yield and wt. The results show that yolk cholesterol concn. decreased with increasing dietary fibre concn., the highest dietary fibre level giving a decrease of 13.29% as compared to the control diet. All added fibre sources studied gave lower yolk cholesterol concn. than the basal diet; ground whole oats and wood shavings gave the greatest reduction. Liver cholesterol concn. tended to increase with increasing dietary fibre concn., the increase being greatest for alfalfa meal or rice mill feed. AJDW

15

New uses of microwave power.

Faillon, G.; Couasnard, C.; Maloney, E. D.

Food Engineering International 3 (9) 46-48 (1978) [En, de, fr, es] [Thomson-CSF Div. Tubes Electroniques, Boulogne, France]

See FSTA (1977) 9 11E404.

16

Ion-exchange chromatography and electrophoresis of egg yolk.

McBee, L. E.; Cotterill, O. J.

Journal of Food Science 44 (3) 656-660 (1979) [En] [Dep. of Food Sci. & Nutr., Univ. of Missouri-Columbia, Columbia, Missouri 65211, USA]

Pure egg yolk was fractionated using DEAE ion-exchange cellulose. Eluted components were simultaneously detected by fluorescence and UV absorption. Selected chromatographic fractions were subjected to disc gel electrophoresis and assayed for total lipids, amino acids and P. Native egg yolk was separated into 18 peaks chromatographically and 23 bands electrophoretically. Multicomponent chromatographic peaks were demonstrated by electrophoresis. Chromatographic peaks and corresponding electrophoretic bands were identified by

literature reference for lipovitellin, livetins, phosvitin and a low density fraction. A direct relationship existed between chromatographic position and electrophoretic mobility. Lipid and P concn. were high in the same fractions. IFT

17

[Effectiveness of yeasts from purified paraffins.]

Ladan, P. E.; Uzhako, P. V.; Stepanov, V. I.; Tokarenko, I. P.

Vestnik Sel'skokhozyaistvennoi Nauki, Moscow, USSR No. 3, 65-70 (1979) [3 ref. Ru, en] [Donskoi Ordena Trudovogo Krasnogo Znameni Sel'skokhoz. Inst., Rostovskaya Oblast', USSR]

This review-type article includes information on experiments carried out since 1963 in the authors' Institute on use of protein-vitamin concentrates, obtained by growing yeast on purified n-paraffins from crude oil, in rearing various classes of livestock. Data are tabulated for the chemical composition of pig longissimus dorsi muscle, chemical composition of hens' eggs, and proportions of C15-C25 n-paraffins in hens' meat, liver and yolks of eggs showing that in comparison with customary protein concentrates (e. g. oilseed meals, hydrolysed yeast), the protein-vitamin concentrates were of equal feed value and were biologically harmless. SKK

18

Chromatographic separation of the soluble proteins of hen's egg yolk: an analytical and preparative study.

Burley, R. W.; Vadehra, D. V.

Analytical Biochemistry 94 (1) 53-59 (1979) [11 ref. En] [CSIRO Div. of Food Res., N. Ryde, PO Box 52, Sydney, Australia]

Gel-filtration chromatography on columns of 'Ultragel' in 1.0M sodium chloride was used to fractionate the soluble proteins of the yolk of Australorp hen's eggs. Five fractions were isolated quantitatively: 3 major fractions, each about a third of the total soluble protein by wt. and each consisting largely of 1 of the 3 known proteins, α -, β -, and γ -livetins, and 2 minor fraction, neither more than 3% of the total. One minor fraction contained a single protein of low mol. wt., apovitellenin II, previously isolated from the yolk low-density lipoprotein. The other, referred to as 'δ-livetin', is of very high mol. wt. Recoveries of the soluble proteins were affected by factors such as conc. salt, organic solvents, or heating. AS

19

High-performance liquid chromatographic method for the determination of 25-hydroxycholecalciferol in chicken egg yolks.

Koshy, K. T.; VanDerSlik, A. L.

Journal of Agricultural and Food Chemistry 27 (1) 180-183 (1979) [5 ref. En] [Upjohn Co., Agric. Div., Kalamazoo, Michigan 49001, USA]

A high-performance liquid chromatographic (LC) procedure was developed for the detn. of 25-hydroxycholecalciferol (25-OH-D₃) in chicken egg yolk. The procedure involved extraction with

chloroform/methanol (2:1), solvent partition between hexane and acetonitrile, adsorption column chromatography on silica gel (230-400 mesh) and on microparticulate silica (20 μ m), partition chromatography on a diatomaceous earth support, and quantitation by reversed phase LC on a C18 bonded microparticulate silica column. The identity of 25-OH-D₃ in the final extract was confirmed by the UV spectrum and the mass spectrum of the diheptafluorobutyrate. The endogenous level of 25-OH-D₃ in eggs from chickens on standard diet was 5-8 ng/g. The recovery of 25-OH-D₃ added to pooled egg yolk at the level of 9.5 ng/g was $87.9 \pm 6.8\%$ (n = 9, range 75-97%). The endogenous level was elevated to > 100 ng/g 8 days after intramuscular injection of 0.5 or 1 mg 25-OH-D₃ in corn oil. It was also elevated after the chickens were fed either vitamin D₃ or 25-OH-D₃ at 30 and 45 mg/t feed level. The elevation was higher with the 25-OH-D₃ than with the D₃ fed group. AS

20

Animal feeds and pet foods. Recent developments. [Book]

Sodano, C. S.

Food Technology Review, Noyes Data Corporation No. 50, xi + 258pp. ISBN 0-8155-0737-2 (1979) [En] Park Ridge, New Jersey, USA; Noyes Data Corporation

The detailed, descriptive information in this book is based on US patents issued since April 1973, that deal with animal feeds and pet foods. 2 patents are of interest of food scientists: the addition of amino-sugar to improve the meat: fat ratio of pigs [US Patent 4 065 557, 1977] and isorenieratenes to increase yolk pigment [US Patent 3 822 352, 1974]. VJG

21

[Detection of protease inhibitors in the yolk of hens' eggs and alteration of their activities during embryonic development.]

Sugimoto, Y.; Okita, T.; Koga, K.

Journal of the Agricultural Chemical Society of Japan [Nihon Nogei Kagakkai-shi] 52 (10) 457-462 (1978) [15 ref. Ja, en] [Dep. of Food Sci., Shinan Women's Junior Coll., Japan]

An inhibitor of bovine trypsin (BT) was found to exist in the yolk of hens' eggs; its activity increased with the progress of embryonic development. Egg yolk homogenates prepared at 0 or 16 days incubation were treated with acetone followed by ethanol:ether (1:1). Residues were extracted with tris-HCl buffer (pH 8.0) and fractionated with (NH₄)₂SO₄. Both partially purified preparations inhibited bovine chymotrypsin (BCT) and bacterial alkaline protease (BAP) in addition to BT. The day 0 preparation was more active in inhibition of BCT and BAP than the day 16 preparation. The inhibitors were fairly stable over the pH range 1 to 12; at 70°C (pH 7.6); and even in the presence of 8M urea at neutral pH, while they were labile when treated with 0.1M NaOH at room temp. or when heated to 90°C at pH 7.6. Both inhibitors had no effect on the endogenous acid protease found in egg yolk. [From En summ.] JRR

22

Studies on various products for desirable egg yolk pigmentation.

Brahmakshatriya, R. D.; Shrivastava, S. M.

Indian Veterinary Journal 55 (10) 788-791 (1978) [9 ref. En] [Dep. of Anim. Sci., G. B. Pant Univ. of Agric. & Tech., Pantnagar, (Nainital), Uttar Pradesh, India]

2 studies were conducted using individually-caged single Comb White Leghorn pullets of a single hatch. The pullets received a conventional layer diet, with the addition of 100, 250 or 1000 g turmeric powder/100 kg, 25, 100 or 570 g yellow food colorant/100 kg, 25, 100 or 570 g commercial synthetic colorant preparation/100 kg, or 60 kg fresh chaffed berseem/100 kg. Egg yolk colour was determined (using the Heiman Carver Color Rotor Scale) for eggs laid on the 21st day of 1 trial, and on the 11th and 22nd days of the other. The results show that fresh chaffed berseem or the highest level of the synthetic colorant preparation significantly increased yolk colour intensity, whereas turmeric, yellow food colorant and the lower levels of the commercial preparation had little effect. Turmeric and yellow food colorant caused small yellow spots at the periphery of the yolk. AJDW

23

The effects of antioxidants on the content of polyunsaturated fatty acids in the hen's egg.

Kassab, A.; Abrams, J. T.; Sainsbury, D. W. B.

International Journal for Vitamin and Nutrition Research 49 (2) 199-209 (1979) [20 ref. En] [Dep. of Clinical Vet. Med., Univ. of Cambridge, Cambridge, UK]

In experiments to study whether, in the possible interests of human health, the polyunsaturated fatty acid (PUFA) content of hen's egg can be increased by nutritional means, 3 strains of hen (light, medium, heavy), each at peak of lay, were first fed a basal commercial low-fat diet for 4 wk. Hens were then transferred for 8 wk to either: (i) basal diet + 7.5% safflower oil (SFO); (ii) basal + 7.5% SFO + 0.022% BHT; or (iii) basal + 7.5% SFO + 0.022% dl- α -tocopheryl acetate. Eggs produced were weighed, and yolks weighed and analysed for lipid components. Addition of SFO increased the PUFA content of yolk lipids by 15.4% (linoleic acid 14.1%), the size of the increases being unaffected by the antioxidants. Diet (ii) produced the largest eggs and yolks, but the proportion of yolks was the same on all 3 diets. Total cholesterol content of egg yolks was not significantly affected by diet, age or strain of hen. Implications of the results are discussed. AL

24

Selective extraction of phospholipids from egg yolk.

Ramesh, B.; Adkar, S. S.; Prabhudesai, A. V.; Viswanathan, C. V.

Journal of the American Oil Chemists' Society 56 (5) 585-587 (1979) [10 ref. En] [Lipid Res. Lab., 8, Indrayani Flats, "A", Prabhat Road Lane 15, Poona 411004, India]

Solubility differences of phospholipids and triglycerides in methanol have been used with advantage for selective quantitative extraction of phospholipids, almost free of triglycerides, from egg

yolk. Cholesterol, a comparatively minor component of egg yolk lipids, is easily removed from the methanolic solution of phospholipids by low temp. crystallization (5°C), if required. AS

25

Factors affecting the measurement and utilization of xanthophylls in the egg yolk and broiler skin.

Fletcher, D. L.

Dissertation Abstracts International, B 38 (11) 5110: Order no. 78-06696, 83 pp. (1978) [En] [Univ. of Florida, Gainesville, Florida 32601, USA]

Studies were made of effects of rearing broilers in windowless and open-type houses on skin and shank pigmentation. Results indicated that skin and shank of broilers raised under constant low intensity lighting in windowless houses were less orange than those of broilers reared in open-type houses. A 2nd experiment evaluated yolk pigmentation of eggs produced by 12 strains of laying hen housed under both floor and cage conditions. Significant differences were found between the 12 strains for dominant wavelength, excitation purity and luminosity; effect of housing conditions on pigmentation varied with strain. A 3rd experiment evaluated yolk-pigmenting ability of canthaxanthin and β -apo-8'-carotenal fed to xanthophyll-depleted hens at dietary levels of 0, 2.2, 4.4, 8.8 and 17.6 mg/kg, in a 5 \times 5 factorial treatment design. The dominant wavelength increased from 572.8 nm at 0 mg/kg to 577.9 and 590.6 nm at the 17.6 mg/kg level of β -apo-8'-carotenal and canthaxanthin, resp. From the results, a model was formulated by which yolk colour could be predicted from the feed concn. of these 2 xanthophylls. JA

26

Mathematical modeling of the visco-elastic characteristics of egg yolk.

Sharma, S. C.

Journal of Food Science 44 (4) 1123-1128 (1979) [9 ref. En] [PepsiCo., Tech. Cent., 100 Stevens Ave., Valhalla, New York 10595, USA]

Dynamic shear moduli and particle size distribution of egg yolk were studied, as function of pH, NaCl concn. and holding time. Levels of the treatment variables were selected according to a 3-factor central composite design. Mathematical formulations were developed to predict the selected visco-elastic characteristics. Using these equations optimum levels of the treatment variables were predicted. A pH range of 6.15 ± 0.45 and NaCl concn. of $5.00 \pm 0.75\%$ were found to be optimum to maintain preprocessing elastic modulus to a minimal level. The equations developed herein can be used for optimization of shelf life and functional characteristics of egg yolk. IFT

27

Characterization of the very low density lipoproteins and apoproteins of egg yolk granules.

Kocal, J. T.

Dissertation Abstracts International, B 39 (9) 4257 (1979) [En] [Univ. of British Columbia, Vancouver, British Columbia V6T 1W5, Canada]

The very low density lipoproteins (VLDL) of hen's egg yolk granules were isolated by preparative ultracentrifugation and agarose gel filtration; the VLDL and apo-LVLDL were characterized, and their purity assessed, by ultracentrifugal, electrophoretic and chromatographic techniques. The results are discussed in detail with reference to the fractional composition, aggregation state, carbohydrate composition, and mol. wt. distribution. AJDW

28

Studies on the rancidity of oils and fats. On the effect of phospholipids on the autoxidation of fats in non-aqueous medium.

El-Tarras, M. F. M.; Abdel-Moety, E. M.; Ahmad, A. K. S.; Amer, M. M.

Oleagineux 34 (1) 139-144 (1979) [39 ref. En, fr, es]
[Univ. of Cairo, Egypt]

The authors studied the effect of different concn. (0.1-2.0% w/w) of fresh egg yolk phospholipids on the autoxidation of fresh fatty substrate (S, = methyl esters of the total fatty acids of cottonseed oil) in the presence and absence of 0.1 p.p.m. Cu^{2+} , and the effects of fresh or autoxidized phospholipids (0.5-2.0%) on the autoxidation of fresh or highly autoxidized S, with or without 0.1 p.p.m. Cu^{2+} . The course of autoxidation was monitored by changes in flavour and colour, total and labile peroxide, carbonyl, benzidine and thiobarbituric acid values. Results, shown graphically, demonstrate the antioxidant action of fresh phospholipids; this increases with their concn. and is also evident in autoxidized substrate, but is lost by autoxidation of the phospholipids. [See also FSTA (1977) 9 1N1.] RM

29

The 'settling phenomenon' in egg yolk. What do bacteria do to eggs.

Vadehra, D. V.; Burley, R. W.

CSIRO Food Research Quarterly 38 (2) 40-45 (1978)
[8 ref. En][CSIRO Div. of Food Res., North Ryde, NSW, Australia]

Unusual behaviour, i.e. settling of the solid particles, has been found in egg yolk following the action of certain microorganisms or chemicals. This settling phenomenon has been studied at North Ryde with investigations on the properties of yolk granules, action of thermolysin on yolk, action of CaCl_2 on yolk, separation of yolk livetins, and viscosity changes during yolk settling. Results of tests on egg yolk with chemicals, bacteria and enzymes are tabulated. The authors suggest that some yolk proteins take part in weak intermolecular interactions that act as a barrier to settling by joining the granules, the low density lipoprotein and the livetins. Such weak protein interactions could be sensitive to certain salts and would be disrupted by proteolytic enzymes. VJG

POULTRY

1

Protein efficiency ratio and levels of selected nutrients in mechanically deboned poultry meat.

MacNeil, J. H.; Mast, M. G.; Leach, R. M.

Journal of Food Science 43 (3) 864-865, 869 (1978) [18 ref. En] [Dep. of Food Sci., Pennsylvania State Univ., University Park, Pennsylvania 16802, USA]

3 different types of mechanically deboned poultry meat (MDPM) were obtained from a Pennsylvania poultry processing plant and studied for nutrient composition. Samples of MDPM included material from broiler skinless necks (protein 15.3%, fat 7.9%, moisture 76.7%), broiler backs (protein 11.9%, fat 24%, moisture 63.1%), and a combination of skinless necks and backs (protein 13.7%, fat 17.0%, moisture 69.0%). Protein efficiency ratios (PER) were determined for each type using casein as the standard diet. MDPM from skinless necks had an adjusted PER value of 2.65 which was comparable to the standard casein diet. The combination of necks and backs MDPM also resulted in a PER value that was comparable to the standard casein diet. PER values for MDPM from backs were significantly lower, possibly due to protein alteration as a result of rancidity. Amino acids, fatty acids, caloric content and selected trace minerals were also measured. IFT

2

Poultry processing.

Fox, G. M.; Wright, T. H. (Barker International Inc.)

United States Patent 4 091 503 (1978) [En]

Poultry processing apparatus is described for cutting and breaking the necks of fowl and preparing the necks for withdrawal of the windpipe, oesophagus and crop. IFT

3

Poultry weighing and packing method.

Altenpohl, W. F.; Altenpohl, P. J.

United States Patent 4 094 413 (1978) [En]

Apparatus for sorting and conveying suspended poultry to a container filling apparatus, employing ram means for displacing the poultry to an accumulator station, is described. IFT

4

[Mechanical separation of poultry meat. Application of the process to other types of meat.] La separation mecanique des viandes de volailles. Application du procede aux autres types de viandes. [Thesis]

Deschamps, B. F. M.

178pp. (1977) [81 ref. Fr] Toulouse, France; Ecole Nationale Veterinaire de Toulouse

This thesis is divided into 3 sections; section I, Mechanically-separated poultry meat, covers raw materials, available types of separation equipment, comminution before separation, cooling of the equipment, yield, the histological, physico-chemical and bacteriological characteristics of the separated meat, preservation and its effects on various characteristics of the mechanically-separated meat, and utilization of the

separated meat (with special reference to its use in sausages). Section II, Other applications of mechanical separation, covers application of mechanical separators to other meats, uses of mechanically-separated meat, removal of fat and tendons, etc from meat, application of mechanical separators to recovery of extra edible material from fish, molluscs and crustacea, and utilization for processing of fruit and vegetables. Section III, Mechanically-separated meat in France and the rest of the world, covers the present situation relating to use of the process in France, the USA, Canada, Italy, Switzerland, Denmark, the Netherlands, the Federal Republic of Germany, Austria and the EEC (with special reference to legal aspects). AJDW

5

Calcium uptake and ATPase activity by sarcoplasmic reticulum of red and white poultry muscles.

Whiting, R. C.; Richards, J. F.

Journal of Food Science 43 (3) 662-665 (1978) [20 ref. En] [Dep. of Food Sci., Univ. of British Columbia, Vancouver BC V6T 1W5, Canada]

Sarcoplasmic reticulum was isolated from Pectoralis major (white) and Biceps femoris (red) and assayed for Ca uptake and ATPase activity. The activities did not decline at 4 h postmortem (rigor onset) and decreased only slightly with 24 h ageing. The prerigor P. major sarcoplasmic reticulum preparation had the lowest Ca uptake and ATPase activity, and mixtures of this fraction with others resulted in a lower activity than expected from the proportionate composition. Sarcoplasmic reticulum from B. femoris was affected more than that from P. major by decreasing temp. Freeze-thawing the muscles did not destroy Ca uptake ability. IFT

6

[Water content of poultry meats.]

Stevens, P.

Bulletin Technique d'Information No. 322, 443-447, 515 (1977) [12 ref. Fr] [Inst. Nat. de la Recherche Agron., Sta. de Recherches Avicoles, Nouzilly, 37380 Monnaie, France]

The eating quality of poultry depends to a considerable extent on the water content of the meat, but the quantification of the amount 'naturally' present, and the amount added during processing, is a difficult problem. Sampling and analysis methods are discussed, together with the sources of added water during the processing of poultry. JRR

7

Processor know-how bootstraps a new poultry industry.

Slater, L. E.

Food Engineering International 3 (6) 52-56 (1978) [En, de, fr, es]

A description is given of the planning supply arrangements and processing operations of the new poultry processing factory of Industrias Avicolas de Puerto Rico, Inc. The plant is at El Melou near Coamo, Puerto Rico, and is highly automated. Bled carcasses pass through a Gordon Johnson directional flow

scalded, which was specifically designed for the plant, and uses a low scalding temp. (126–128° F) and takes 2.25 min/bird. Birds are machine-defeathered, singed, washed and manually eviscerated. Giblets are pumped to a giblet chiller, and eviscerated carcasses are spray-washed, inspected and dropped into a Spin Flex Chiller. This reduces body temp. from 90° to 36° F in 45–50 min, and replaces moisture lost during processing in a form that will not subsequently weep out. Chickens are packed whole or cut up, boxed, iced down and distributed within 48 h. DIH

8

[Amino acid composition of the muscle tissue of Guinea fowl.]

Ivashchenko, V. N.; Lizunova, V. V.; Vedeneeva, V. A. *Voprosy Pitaniya* No. 4, 85–86 (1978) [2 ref. Ru] [Novosibirskii Inst. Sovetskoi Torgovli, Novosibirsk, USSR]

The total amino acid content of the white meat of Guinea cocks and hens was 96.9 and 95.48 g/100 g protein, resp.; corresponding figures for the red meat were 97.2 and 94.83. Glutamic acid (21.31–22.20 g/100 g protein) was the major amino acid. On the basis of the amino acid score, methionine was shown to be the limiting amino acid. HBr

9

Incidence of salmonellae in raw meat and poultry samples in retail stores.

Swaminathan, B.; Link, M. A. B.; Ayres, J. C. *Journal of Food Protection* 41 (7) 518–520 (1978) [12 ref. En] [Dep. of Food Sci., Univ. of Georgia, Athens, Georgia 30602, USA]

An examination of 142 samples of raw beef, pork, and poultry from 5 retail stores in Athens, Georgia, showed an overall incidence of 14.8% contamination by salmonellae. Pork samples had the max. contamination (21.5%). Samples were obtained in lots of about 25 over a 6-wk period and the extent of contamination by salmonellae in the products purchased every wk fluctuated over a narrow range (12.5–19.2%). Higher levels of contamination were observed in samples purchased from 2 national supermarkets than in samples purchased from a regional supermarket, a local grocery store and 1 national supermarket. *Salmonella typhimurium* and *S. agona* were the serotypes isolated most frequently from the samples. AS

10

Microbial modifications in raw and processed meats and poultry at low temperatures. [Lecture]

Jay, J. M.; Shelef, L. A. *Food Technology* 32 (5) 186–187 (1978) [14 ref. En] [Dep. of Family & Consumer Resources, Wayne State Univ., Detroit, Michigan 48202, USA]

The precise mechanisms of action of microorganisms on meat are not known but this paper reviews and explains the known microbial modifications. These include: pH increase during low-temp. spoilage by Gram-negative flora and pH decrease during spoilage by Gram-positive flora; degradation by spoilage flora of non-protein N compounds, lipids and sarcoplasmic,

myofibrillar and stroma proteins; and increase in water-holding capacity during low-temp. spoilage. Mention is also made of the predominance of Gram-negative flora on fresh meat and of Gram-positive flora (chiefly lactic acid bacteria) on processed meat. [See FSTA (1979) 11 1B3]. JA

11

[Heat processing of poultry from economic and organoleptic viewpoints.]

Buriankova, J.

Prumysl Potravin 29 (3) 156–159 (1978) [Cs, ru, en, de] [Vyzkumny Ustav Drubezarskeho Prumyslu, Bratislava, Czechoslovakia]

Production of dressed poultry carcasses increased in Czechoslovakia from 4690 t in 1950 to 119 500 t in 1975 and is expected to reach 154 000 t in 1980 and 202 000 t in 1990. Experiments on cooking of breasts and legs of chickens, turkeys and ducks were carried out in the author's Institute using (i) Husqvarna Elektronik type 241 microwave ovens, (ii) Rotatherm type HL 4 convection ovens, (iii) Mora electric cookers, or (iv) Union pressure cookers (0.75 atm), cooking in (i) and (ii) being without water or covered or uncovered in water, cooking in (iii) being covered or uncovered in water, and cooking in (iv) being at atm pressure or in water or steam. Data on duration of cooking, and wt. yield and DM content of cooked products are tabulated and findings are discussed in detail. Microwave cooking proved unsuitable for duck meat. In general, (iv) proved best for stewing or steaming and (ii) for roasting. SKK

12

Standard for boxes, corrugated fiberboard for graded poultry.

Canada, Canadian Government Specifications Board *Canadian Government Specifications Board Standard* CGSB 43-GP-40, 23pp. (1977) [En, Fr]

13

[Water hygiene and wholesomeness of foods.]

Pantaleon, J.; Gledel, J.; Cumont, G.

Bulletin Technique d'Information No. 322, 449–457 (1977) [Fr] [Direction de la Qualite Services Veterinaires, Lab. Cent. d'Hygiene Alimentaire, 43 rue de Dantzig, 75015 Paris, France]

The sources and effects of water pollution are discussed in relation to the use of water in the preparation of foods. Biological contamination of water may take place due to primary pollution of the water source, or may occur during the use of the water, e.g. the risk of *Salmonella* cross-contamination in the rinsing baths used in poultry processing. Water sources and treatments for the removal of biological contaminants are described. Chemical contaminants are more diverse in nature than biological ones; the subject is discussed with reference to nitrate/nitrite, heavy metals, organic materials, particularly pesticides, and radionuclides. JRR

14

Start up steam-texturized soy protein products production.

Andres, C.

Food Processing 38 (12) 53 (1977) [En]

Steam-texturized soy proteins are produced by mixing the dry ingredients, adding liquid ingredients and water, mixing, conditioning, feeding the mixture into the "guns" where steam texturization occurs, product removal from the "guns", sizing and packaging. Retention time in the "gun" is < 1 s; temp. is 440°F ; internal pressure is approx. 120 lb/in^2 ; and the "gun" operates at approx. 120 shots/min; Boutrae brand produced is produced by Central Soya from soy flour, by this system. It is said to be especially suitable as an extender for fish, seafood and poultry products. Central Soya also produces Centex (from soy flour) and Response (from soy concentrate) by thermoplastic extrusion. HBr

15

[The cold store and refrigeration equipment of the Bekescsaba poultry processing plant.]

Szentivanyi, G.

Hűtőipar 24 (1) 1-8 (1977) [Hu, en, ru]

16

Poultry processing.

Graham, K. Z.; Graham, J. R.

United States Patent 4 097 960 (1978) [En]

Poultry is suspended in a neck-down attitude and moved along a rectilinear path in a manner so that the necks are supported by bird-holding structure while they are contacted with an array of rotating blades. IFT

17

Modification assembly to a machine for processing the backs of poultry.

Martin, E. G.; Risser, D. M. (Victor F. Weaver Inc.)

United States Patent 4 102 014 (1978) [En]

18

Processing of poultry feet.

Herrick, D. (Foster Farms)

United States Patent 4 102 015 (1978) [En]

An apparatus is described for processing poultry feet and the like for use with a line for processing poultry wherein shackles suspended from a conveyor individually engage the legs of each bird for transport along a predetermined processing path. IFT

19

Apparatus for injecting a liquid additive in poultry flesh.

Strandine, E. J.; Koonz, C. H. (Swift & Co.)

United States Patent 4 102 258 (1978) [En]

An improved injection apparatus is described, which is inserted by hand between the skin and flesh of a poultry carcass from the posterior end for injecting an additive material into the flesh thereof, said apparatus being connectable to a source of additive supply. IFT

20

New design criteria of air-chilling equipment for poultry. [Lecture]

Veerkamp, C. H.

International Congress of Food Science & Technology - Abstracts p.118 (1978) [En] [Spelderholt Inst. for Poultry Res., Min. of Agric. & Fisheries, Beekbergen, Netherlands]

Air-chilling equipment for poultry was especially designed to decrease wt. losses by evaporation of water from the product, by using evaporators with large surface areas and by circulating air at a low temp. ($< -5^{\circ}\text{C}$). Calculations and laboratory experiments showed that the heat flow due to the evaporation of water from the product contributed $\geq 50\%$ of the total heat removal. Wt. losses of the product were avoided by keeping the product wet, specially during the first part of the chilling operation. These results led to the design of a new air-chiller for poultry. Experiments with this industrial air-chiller proved that the heat removal and the wt. losses of the product were comparable to the predicted values; product wt. loss was decreased from about 1.7% in a conventional air-chiller to about 0.8% in the new type of air-chiller. [See FSTA (1979) 11 2A60.] AS

21

Quantitative comparison of proteases found in skeletal muscle of various muscle food animals. [Lecture]

Kang, C. K.; Busch, W. A.; Jodlowski, R. F.; Warner, W. D.

International Congress of Food Science & Technology - Abstracts p.232 (1978) [En] [Swift & Co., R&D Cent., 1919 Swift Drive, Oak Brook, Illinois 60521, USA]

Neutral (pH optimum 7.5) and acid (pH optimum 5.5) protease systems were extracted from the skeletal muscles of food animals. Protease potency and extractability were affected by post-mortem ageing, by the presence of salts and chelating agents, and by the type, pH and ionic strength of buffers. Neutral beef protease is of the sulphydryl type while the acid protease is not. The amounts of neutral protease extracted from cattle, sheep, rabbit, turkey and chicken muscles were inversely related to the size and maturation rate of the animals and directly related to meat tenderness. [See FSTA (1979) 11 2A60.] JA

22

Rapid detection of salmonellae in foods by membrane filter-disc immunoimmobilization technique.

Swaminathan, B.; Denner, J. M.; Ayres, J. C.

Journal of Food Science 43 (5) 1444-1447 (1978) [18 ref. En] [Dep. of Food Sci., Univ. of Georgia, Athens, Georgia 30602, USA]

A membrane filter-disc immunoimmobilization technique was developed for rapid detection of salmonellae in foods. The method involves concentrating bacteria from the selective enrichment culture of a food sample by membrane filtration. The membrane filter, with the entrapped bacteria, is

inverted and placed on the surface of a semi-solid selective medium contained in a 100 × 15 mm plastics Petri plate. A paper disc impregnated with Salmonella polyvalent flagellar antiserum is placed on the surface of the semi-solid agar approx. 2.5 cm from the nearest edge of the membrane filter. The plate is incubated at 37° C under high humidity. Motile salmonellae, if present in the sample, grow and migrate in the semi-solid medium. When the moving front of motile salmonellae come into contact with the diffusing flagellar antiserum, an antigen-antibody reaction occurs, resulting in the immobilization of salmonellae. Formation of a line of immobilization indicates the presence of salmonellae in the sample. A semi-solid medium containing dulcitol, proteose peptone, brilliant green, and novobiocin as the major functional components was found to be more efficient than semi-solid modifications of Salmonella-Shigella agar and Hektoen enteric agar for the detection of salmonellae in foods by the membrane filter-disc immunoimmobilization procedure. The new method, when applied to the detection of salmonellae in raw meats and poultry, was found to give good correlation with the conventional cultural method. IFT

23

Potential for water reuse in an Egyptian poultry processing plant.

Hamza, A.; Saad, S.; Witherow, J.

Journal of Food Science 43 (4) 1153-1157, 1161 (1978) [8 ref. En] [Alexandria Univ., Higher Inst. of Public Health, 165 El Horreya, Alexandria, Egypt]

The water usage and waste loads were determined for 10 unit operations in a modern poultry processing plant in Alexandria, Egypt. Conc. of 10 wastewater parameters and 9 heavy metals, identification of 12 bacteria and enumeration of both total aerobic and coliform bacteria in the wastewater from these unit operations were determined to evaluate the potential for water reuse. In the scalding, washer and chillers, bacterial counts in the water and on the carcasses were directly related and increased with the length of water usage. Based on the study, countercurrent water use through the chillers and washer was planned after applying renovation measures for grease and bacterial reductions. Compressor cooling water quality was satisfactory for reuse in the scalding. IFT

24

[Poultry meat aroma.] Hühnerfleischaroma.

Salzer, U.-J.

Feinkostwirtschaft 15 (2/3) 74-76 (1978) [De]

[Haarmer & Reimer GmbH, 3450 Holzminden, Federal Republic of Germany]

The aroma of poultry meat was investigated by taste panel testing of broths of chicken, beef and pork, and by detn. of the correlation of the TS content of chicken broth with its taste score. Generally, broths with high TS contents rated best in taste tests; scores declined with increasing age during ≤ 7 wk in frozen storage at -18° C. The development and areas of applications of natural poultry aroma preparations for the food industry are briefly discussed. JRR

25

[Evaluation of poultry carcasses.]

Schlachtwertuntersuchungen von Geflügel.

Gey, K.; Dzyalek, P.

Fleisch 32 (4) 66-68 (1978) [De]

A standardized procedure for evaluation of the carcass quality of poultry is described, based on detn. of the yield of edible material and the carcass colour, incidence of blemishes or feather residues, content of high-value cuts, meat:bone and fat:meat:bone ratios, and the cooking losses, pH, water holding capacity, colour, tenderness and protein and fat contents of the meat. The importance of standardization of pre-evaluation handling (transport, slaughter, scalding, plucking) for reliable carcass evaluation is stressed. IN

26

[The hygiene of various methods of refrigeration of carcasses in abattoirs for poultry.]

Laga, M.

RTVA 15 (119) 31-36; (120) 20-24 (1976) [Fr]

After a discussion of cooling and the microbiological quality of poultry carcasses (covering cooling methods, sources of microbial contamination of the carcass, bacteria occurring on carcasses, and growth of pathogenic and spoilage bacteria), studies on effects of 4 cooling methods on the hygienic quality of chicken carcasses are described. The 4 methods tested were (i) cooling in a water bath, (ii) cooling in a spin-chiller, with recirculation of water, (iii) cooling in a spin-chiller without recirculation of water; and (iv) spray-cooling. Counts of Enterobacteriaceae, *Escherichia coli*, and total aerobic count after incubation for 5 days at 22° C or 3 days at 37° C were determined before and after cooling; tables of results are given. The results show that bacterial counts of carcasses cooled by methods (i), (ii) and (iii) increased and those of carcasses cooled by (iv) decreased during chilling. Studies were also conducted on cross-contamination with salmonellae during cooling by methods (i), (ii) and (iii). The results show considerable cross-contamination during cooling by (i) and (ii), but only slight cross-contamination during cooling by (iii). AJDW

27

Variable frequency stunning and a comparison of two bleed-out time intervals for maximizing blood release in processed poultry.

Kuenzel, W. J.; Ingling, A. L.; Denbow, D. M.; Walther, J. H.; Schaeffer, M. M.

Poultry Science 57 (2) 449-454 (1978) [3 ref. En] [Dep. Poultry Sci., Univ. of Maryland, College Park, Maryland 20742, USA]

Best blood release from broilers, important both for meat quality and potential effluent load, was obtained at a peak voltage of 100V combined with an average voltage of 30V and a frequency of 480 Hz. Processing plants using DC stunners are recommended to increase bleed-out time from the standard 60 s to ≥ 90 s. From the electrical costs viewpoint, an AC circuit (60 Hz) was the most efficient, followed by variable frequency, with DC the least efficient. HBr

28

Study of Salmonella disinfection in poultry packing plant effluents.

Marvan, I.; Nutt, S.; Riddle, M.

Food in Canada 38 (1) 23-24 (1978) [En] [Dearborn Environmental Consulting Services, Canada]

In view of the relative frequency of human salmonellosis in Canada and the obvious involvement of poultry, a government initiated programme was set up to compare the efficiency of O_3 and Cl for disinfection of treated effluents from poultry processing plant; to define the optimum operating conditions for (i) chlorination and (ii) ozonization; to compare the relative toxicity of the effluents after (i) or (ii); to compare data obtained from 3 major poultry packing plants (in Ontario) for practical assessment of the treatments' efficacy; and to evaluate the economic implications. Results are tabulated. Pilot-scale (i) at 10 mg available Cl/l. with 45 min contact time successfully controlled salmonella discharge under both summer and winter conditions, while (ii) at 30 mg O_3 /l. with 60 min contact time was effective in 80% of tests carried out. Operating costs were approx. \$0.054 and \$0.17/1000 Imperial gal for (i) and (ii), resp. It is stressed that disinfection requirements vary at every plant and that specific local conditions need to be taken into account. HBr

29

New products of poultry and fish. [Lecture]

Baker, R. C.

Proceedings of the Meat Industry Research Conference pp. 141-143 (1978) [En] [Cornell Univ., Ithaca, New York, USA]

Research on development of new poultry meat, egg and fish products at Cornell University is discussed, with special reference to the need for development of new uses for underutilized resources. The steps involved in product development at Cornell University are described (using a fish chowder product based on mechanically deboned fish as an example), with reference to the initial concept, the development stage, taste panel studies, shelf-life studies, packaging, production, and market testing. [See FSTA (1979) 11 3G208.] AJDW

30

[Treatment of effluent in the poultry processing industry.]

Straszewski, T.

Przemysł Spożywczy 32 (5) 194-195 (1978) [23 ref. Pl, fr, de, en] [Centralny Ośrodek Badawczo-Rozwojowy Drobiarstwa, Poznań, Poland]

Tests showed that the biological treatment of poultry processing plants by the low load, activated sludge method met Polish requirements for effluent treatment. Further studies are recommended on the utilization of waste from excess sludge as a source of protein and mineral salts. AS

31

Choosing the best conditions for heat sterilization of canned poultry meat in rotary autoclaves.

Anon.

Fleischwirtschaft 58 (6) 960-961; 968-970 (1978) [7 ref. En, de]

This report on laboratory and factory trials in the USSR to determine primal conditions for sterilizing canned poultry meat in rotary autoclaves suggests the following parameters: 15 rev/min, liquid content 20%, headspace 8%, sterilization temp. 125° C. The specific cooking time/kg material falls with increase in size of can, from 140 ± 3 min for No. 3 size (capacity 250 ml) to 120 ± 8 min for No. 8 (353 ml) and 110 ± 7 min for No. 12 (565 ml). Meat sterilized under these conditions was similar to cooked meat, without 'sterilized' flavour. Factory tests showed that rotary autoclaves shortened the sterilization time and improved product quality, compared with stationary autoclaves. RM

32

Methods and facilities for grading broilers and turkeys.

Harris, C. E.

Marketing Research Report, USDA No. 1091, 35pp. (1978) [8 ref. En] [Animal Products Marketing Lab., Beltsville Agric. Res. Cent., Maryland 20705, USA]

Methods and facilities for grading whole ready-to-cook broilers and turkeys were analysed in 18 commercial plants where grading was performed under the supervision of USDA licensed graders. Six plants (3 broiler and 3 turkey processors) selected as representative for grading methods, and facilities throughout the industry were analysed for features affecting grading efficiency and accuracy and personal comfort and fatigue. The facilities at or near the sorting and grading areas are described with the aid of diagrams and improvements suggested. USDA poultry grading regulations, grading facility and equipment requirements, and quality specifications for individual carcasses and parts are appended. RM

33

[Arsenic residues in meat and organ samples from domestic slaughter animals, water fowl and game.]

Arsenrückstände in Fleisch- und Organproben von schlachtbaren Haustieren, Wassergeflügel und Niederwild.

Holm, J.

Fleischwirtschaft 58 (9) 1545-1546; 1446 (1978) [11 ref. De, en] [Staatliches Veterinäruntersuchungsamt, Dresdenstrasse 6, 3300 Braunschweig, Federal Republic of Germany]

As residues were determined in meat, liver and kidney samples from 65 pigs, 40 bulls and steers, 35 calves, 50 cows, 30 horses, 269 geese, 27 ducks, 29 deer, and 11 hares from Lower Saxony. Samples were analysed by wet digestion and AAS. Tabulated data showed mean As concn. (p.p.m.) of ≤ 0.01 fresh wt. (max. 0.030) in meat (except for 0.024 in hares), ≤ 0.017 (max. 0.051) in liver, and ≤ 0.034 (max. 0.087) in kidneys. In contrast, beef from potential As-immission areas contained mean 0.063 (max. 0.160) in meat, 0.067 (0.140) in liver and 0.132 (0.221) in kidneys. RM

34

A comparison of four agar plating media with and without added novobiocin for isolation of Salmonella from beef and deboned poultry meat.

Moats, W. A.

Abstracts of the Annual Meeting of the American Society for Microbiology 78, 193 (1978) [En] [USDA, Beltsville, Maryland, USA]

Hektoen, XLD, and 2 brilliant green agar formulations, Tryptic-soy brilliant green (TSBG) and Tryptic-soy xyloselysine (TSXL) agars, were compared with or without 10 mg added novobiocin/l. 75 samples of roast beef and deboned poultry meat from sample series suspected of containing *Salmonella* were tested. Colonies giving a reaction typical of *Salmonella* on these media (alkaline black-centred colonies) were picked. Numbers of false positives without and with novobiocin, resp., were: XLD - 17, 2; Hektoen - 58, 23; TSXL - 0, 2; TSBG - 7, 5. Numbers of samples found positive for *Salmonella* without and with novobiocin, resp., were: XLD - 16, 21; Hektoen - 13, 17; TSXL - 23, 23; TSBG - 22, 20. Total of samples *Salmonella* positive on ≥ 1 agar was 25. The predominant organism producing false positive colonies on XLD and Hektoen agars without novobiocin was *Proteus mirabilis*. Growth of *Proteus* was almost completely eliminated by addition of novobiocin. *Citrobacter freundii* was the other major type which formed false positive colonies. Because of the high specificity of XLD with novobiocin and TSXL with or without novobiocin, appearance of *Salmonella*-like colonies on these media can be considered a presumptive test for *Salmonella*. AS

35

Activated sludge treatment of poultry processing water.

Whitehead, W. K.

Poultry Science 57 (2) 433-438 (1978) [7 ref. En] [ARS, USDA, Richard B. Russell Agric. Res. Cent., Athens, Georgia 30604, USA]

Wastewater from a poultry processing plant was treated with activated sludge in a laboratory-scale system. Results of the study showed that the activated sludge method was feasible, and that it removed > 90% of the COD, suspended solids and fat. Overall performance and sludge settling characteristics were best at a sludge age of 2-3.5 days. AS

36

Effectiveness of tranquillizers before killing.

Kijowski, J.; Trojan, M.; Niewiarowicz, A.; Pikul, J. *Poultry International* 17 (3) 36, 38 (1978) [En, de, it, es, fr]

Studies were conducted to evaluate effects of tranquillizers (diazepam or sodium barbital, administered in the drinking water or directly per os) on stress and consequent meat quality defects etc. in broilers and ducks. The results show that tranquillizers appreciably reduced the wt. losses during transport, reduced the incidence of blemishes etc., improved carcass grades, and considerably reduced the incidence of the pale soft exudative meat defect. Persistence of tranquillizer residues in edible tissues is also briefly considered. AJDW

37

The elimination of enteric bacterial pathogens from food and feed of animal origin by gamma irradiation with particular reference to salmonella radication.

[Review]

Mossel, D. A. A.

Journal of Food Quality 1 (1) 85-104 (1977) [many ref. En] [Fac. of Vet. Med., Univ. of Utrecht, Biltstraat 172, Utrecht, Netherlands]

Despite world-wide severe under-reporting of food-transmitted disease of microbial origin, it is clear that the majority of such diseases is caused by enteropathogenic Enterobacteriaceae. Most of these are spread by foods of animal origin, consumed raw, or recontaminated subsequent to industrial or culinary heat processing. Radication with the help of γ rays of carcasses or consumer size cuts presents a real solution to this problem. An ecologically based procedure for the estimation of the most probable effective dose for the elimination of enteric pathogens of bacterial origin from fresh meats, poultry and seafoods is described, special attention being paid to bacteriological analytical methodology found useful under conditions of practice. An additional advantage of this approach is, that it will allow easy assessment of lower doses, following reductions of initial enterobacterial loads, which should be attempted in parallel. It is demonstrated that most alleged counter-indications so far hampering the use of ionizing radiation in food processing have now been eliminated, allowing full advantage to be derived from radication as an essential contribution to the protection of the consumer against disease of microbial aetiology spread by foods. AS

38

Treatment of animal feeds with ionizing radiation. V. Petition and clearance for radicated poultry feed.

(In 'Food preservation by irradiation' [see FSTA (1979) 11 4G312].) [Lecture]

Eisenberg, E.; Lapidot, M.

II, 255-263 (1978) [21 ref. En] [Soreq Nuclear Res. Cent., Yavne, Israel]

Experience obtained in Israel regarding procedures for petitioning and granting clearance for irradiated food is briefly reviewed. Since meat of poultry raised on radicated feed is for human consumption, feed is thus included in the definition of food in Public Health (Rules as to Food) Ordinance and requires a regular petition. The petition to clear irradiated poultry feed is described in detail. AL

39

Optimalisation of a MacConkey-type medium for the enumeration of Enterobacteriaceae.

Mossel, D. A. A.; Eelderink, I.; Koopmans, M.; Rossem, F. van

Laboratory Practice 27 (12) 1049-1050 (1978) [20 ref. En] [Fac. of Vet. Med., Univ. of Utrecht, Utrecht, Netherlands]

A preparation of Violet Red Bile Dextrose Agar has been developed that is free from antimicrobial properties towards non-stressed populations of Enterobacteriaceae. It allows excellent recovery of that taxon, and when used as thickly layered poured plates efficiently selects Enterobacteriaceae from an overwhelming population of non-fermentative taxa of Gram-negative rod-shaped bacteria, when these occur in minced meats and frozen poultry. AS

40

Estimating calcium in mechanically deboned poultry meat by oxidimetry and atomic absorption spectrophotometry.

Germs, A. C.; Stennenberg, H.

Food Chemistry 3 (3) 213-219 (1978) [11 ref. En] [Processing Dep., Spelderholt Inst. for Poultry Res., Min. of Agric. & Fisheries, Beekbergen, Netherlands]

In samples taken over 6 months from 68 lots of mechanically deboned poultry meat from 5 Dutch processors using 4 different types of machine, mean Ca content determined by AAS was 2.36 g/kg. To find a method requiring less sophisticated equipment, 2 oxidimetric methods were investigated, i.e. Peter's method (see *Zeitschrift für Analytische Chemie* (1966) 220, 421-426) and the AOAC (1970) method 14014. Both oxidimetric methods were sufficiently accurate and repeatable for in-plant quality control to max. 2.5 g Ca/kg, with s.d. for accuracy 0.13, for repeatability 0.09, and confidence interval 0.40 g/kg ($p = 0.95$) on duplicate subsamples from 10 meat samples with 1.1 to 6.4 g Ca/kg. The relationship between AAS and Peter's method could not be explained satisfactorily from analysis of covariance, while the AOAC method corresponded well with AAS (coeff. of correlation $r = 0.9996$, standard error of regression = 0.05): both r and s.e. were significantly better than those for Peter's method. RM

41

Industry up in arms about proposed ban on feed antibiotics.

Hendrickson, R. M.

Poultry International 17 (1), 30, 32, 34, 36 (1978) [En, de, fr, it, es]

FDA proposals to limit use of antibiotics in animal feeds, including poultry feeds (because of the claimed possible danger of transfer of antibiotic resistance to human pathogens) are critically discussed. It is suggested that the use of feed antibiotics at low levels does not present a significant health hazard, that use of antibiotics is necessary for production of an adequate supply of animal protein, and that the increase in disease resulting from a ban on feed antibiotics could result in a deterioration of hygienic standards of poultry meat, as diseased flocks are likely to be hurriedly slaughtered. AJDW

42

Poultry cleaning.

Nicolls, P. L. (Empire Foods Inc.)

United States Patent 4 106 161 (1978) [En]

Poultry cavity washing apparatus which employs a source of pressurized water is described. IFT

43

Use of glutaraldehyde as a poultry processing equipment sanitizer.

Mast, M. G.; MacNeil, J. H.

Poultry Science 57 (3) 676-680 (1978) [11 ref. En] [Dep. of Food Sci., Pennsylvania State Univ., University Park, Pennsylvania 16802, USA]

Laboratory studies were conducted to determine the efficacy of glutaraldehyde (1,5-pentanedial) as a sanitizer for poultry processing equipment when used in soaking or spraying applications. Sections of conveyor belts were artificially contaminated with organic matter and then soaked in varying concn. (20-800 p.p.m.) of glutaraldehyde and Cl for ≤ 4 h. Glutaraldehyde was consistently more effective than Cl in reducing bacterial numbers. For example, after the belts were soaked for 30 min in 200 p.p.m. solutions 99.9% of the bacteria were destroyed by glutaraldehyde, whereas 90% were destroyed by Cl. Lower bacterial counts were achieved by increasing the soaking time and/or concn. of sanitizer. Concn. of 10-7000 p.p.m. glutaraldehyde were used in spraying applications to determine an effective range. Concn. of 100 p.p.m. (and less) were ineffective in reducing bacterial numbers. When comparable concn. of glutaraldehyde and Cl were used in spraying applications, Cl consistently destroyed more bacteria than glutaraldehyde. AS

44

Use of glutaraldehyde as a disinfectant in immersion chilling of poultry.

Mast, M. G.; MacNeil, J. H.

Poultry Science 57 (3) 681-684 (1978) [13 ref. En] [Dep. of Food Sci., Pennsylvania State Univ., University Park, Pennsylvania 16802, USA]

Laboratory tests were conducted to determine the efficacy of glutaraldehyde (1,5-pentanedial) as a disinfectant when used in simulated commercial chilling. Poultry carcasses were held in chillwaters (3° C) consisting of either 50 p.p.m. glutaraldehyde, 50 p.p.m. Cl; or water (control) for 45 min. Chilling reduced the number of bacteria on all carcasses; those chilled in glutaraldehyde retained lower counts throughout 10 days of storage at 3° C. Glutaraldehyde-chilled carcasses had a shelflife 2 days longer than Cl-chilled carcasses and 3 days longer than controls. There were no significant ($P < 0.05$) differences in moisture uptake, moisture retention, or colour among carcasses chilled in the 3 solutions. [See preceding abstr.] AS

45

[Water contents of frozen and deep-frozen poultry carcasses.]

Stevens, P.; Sauveur, B.

Bulletin Technique d'Information No. 321, 319-328 (1977) [Fr] [Sta. de Recherches Avicoles, INRA, Cent. de Recherches de Tours-Nouzilly, 37380 Monnaie, France]

To gain information on the net amount of water 'added' to poultry carcasses during processing and freezing, a collaborative study between 8 members of the EEC was carried out, in which carcasses were (i) prepared without the use of water; or (ii) prepared dry, and treated in water, with measurement of the amount of water absorbed, before freezing and storage for ≥ 7 days. For analysis, whole carcasses were ground and analysed for moisture and protein contents, or edible parts were separated and moisture and lipid analyses were made on these parts alone. This design allowed calculation of the following regressions:

physiological water content (PWC) on protein content; total water content (PWC + 'added' water) on protein content; PWC on defatted edible wt.; and total water content on defatted edible wt. Regressions of water on protein contents only are reported. For chickens, the slopes of the regression lines were significantly different for (i) and (ii): 3.47 g H₂O/g protein, $r = 0.99$ vs. 3.31 g H₂O/g protein, $r = 0.98$ resp. In the case of fowls (male and female), the slopes were not different, but the regression lines were widely separated. In both types, mean levels of water were significantly affected by treatment, but the difference was more difficult to detect in fowls. JRR

46

[Microflora characteristics of meat of poultry frozen traditionally or in liquid nitrogen.]

Knaut, T.; Zawadzki, Z.; Pogorzelska, E.; Uradzinski, J.; Sycianko, K.; Nowicka, E.; Warminska-Radyko, I.; Wisniewska, K.

Zeszyty Naukowe Akademii Rolniczo-Technicznej w Olsztynie No. 178 (Special Issue), 47-54 (1977) [16 ref. Pl, ru, en] [Katedra Higieny Produktów Zwierzęcych, ART, Olsztyn, Poland]

Batches of 30 plucked and eviscerated chicken and duck broiler carcasses were cooled in ice-water, wrapped in foil and frozen (i) whole traditionally in air or (ii) in halves, by tunnel spraying with liquid N₂ (conditions not stated). Microbiological examination was carried out directly before and after freezing and after 3, 6 or 12 months frozen storage (conditions not stated). For examination, the carcasses were defrosted in a water bath at 30° C for 30-60 min. Values for total bacterial counts, psychrotrophic counts, and coliform and enterococci titres in surface swabs from under thigh and wing are tabulated for the experimental variants. There were no significant differences between (i) and (ii) or significant changes during storage. Total counts were in the 10²-10⁴/cm² range; psychrotrophic bacteria were dominant. SKK

47

Enrichment procedures for isolating salmonellae from raw meat and poultry.

Thomason, B. M.; Dodd, D. J.

Applied and Environmental Microbiology 36 (4) 627-628 (1978) [6 ref. En] [Cent. for Disease Control, Public Health Service, US Dep. of Health, Education & Welfare, Atlanta, Georgia 30333, USA]

The combined use of direct enrichment in tetrathionate broth containing brilliant green dye and pre-enrichment in buffered peptone-water followed by enrichment in tetrathionate broth yielded the max. recovery of salmonellae from raw meat and poultry samples. AS

48

Comparison of four agar plating media with and without added novobiocin for isolation of salmonellae from beef and deboned poultry meat.

Moats, W. A.

Applied and Environmental Microbiology 36 (5) 747-751 (1978) [11 ref. En] [Agric. Res. Cent., USDA, Beltsville, Maryland 20705, USA]

4 plating media, Hektoen enteric (HEC), xylose-lysine deoxycholate (XLD), tryptic soy-xylose-lysine (TSXL), and tryptic soy-brilliant green (TSBG) agars with and without 10 mg added novobiocin (NB)/ml, were evaluated for recovery of *Salmonella* from roast beef and deboned turkey. Colonies producing a reaction typical of H₂S-positive salmonellae were picked. Numbers of salmonellae found and false positives were determined. Addition of NB markedly improved isolations of salmonellae from XLD and HEC and reduced the number of false positives; it did not improve performance of TSXL, and slightly impaired differentiation of salmonellae from *Citrobacter* on TSBG. XLD + NB and TSXL are highly specific for H₂S-positive salmonellae, and the appearance of *Salmonella*-like colonies on these media can be considered a presumptive test for H₂S-positive salmonellae. AL

49

Lactic acid bacteria as an antispoilage and safety factor in cooked, mechanically deboned poultry meat.

Raccach, M.; Baker, R. C.

Journal of Food Protection 41 (9) 703-705 (1978) [15 ref. En] [Poultry Sci. Dep., Cornell Univ., Ithaca, New York 14853, USA]

The effects of commercial lactic acid starter cultures of *Pediococcus cerevisiae* (Accel) and *Lactobacillus plantarum* (Lactacel DS) on spoilage of and pathogen growth in cooked mechanically deboned poultry meat (MDPM) were studied. *P. cerevisiae* or *L. plantarum* or a 50/50 mixture was added to MDPM to give 10⁹ cells/g or 2 × 10⁹/g for the mixture. MDPM samples then received separate additions of *Pseudomonas fluorescens*, *Ps. fragi*, *Ps. putrefaciens*, *Salmonella typhimurium* or *Staphylococcus aureus*, in the range 10³-10⁴ cells/g MDPM. Cooked MDPM inoculated with *Pseudomonas* was stored at 3° C; addition of the lactic acid bacteria (LAB) mixture delayed time for off-odour production (10⁷ *Pseudomonas* cells/g) to 4-5 days, a delay of 1-2 days vs. controls. The LAB mixture totally repressed growth of *Salmonella* in cooked MDPM stored at 11° C, and totally repressed growth of *Staphylococcus* in that stored at 15° C. The LAB mixture was more effective than either *Pediococcus* or *Lactobacillus* alone. The pH of cooked MDPM changed by a max. of 0.2-0.3 units in all experiments, a value too small to have caused the observed repression of growth. DIH

50

[Effect of freezing method on quality characteristics of duck meat.]

Korzeniowski, W.; Zamojski, J.; Batura, J.; Kwiatkowska, A.; Jankowska, B.; Przysztupa, G.; Marczak, K.; Puczyński, M.; Dolatowski, Z.

Zeszyty Naukowe Akademii Rolniczo-Technicznej w Olsztynie No. 178 (Special Issue), 67-78 (1977) [19 ref. Pl, ru, en] [Inst. Inżynierii i Biotech. Żywności, ART, Olsztyn, Poland]

Carcasses of Peking ducks cooled for 4 h to 4-6° C were divided into 2 groups of 120 and either (i) tunnel frozen traditionally to -18° C in breast muscle, or (ii)

frozen in a British Oxygen Co. liquid N_2 installation at from -101° to -115° C for 18 min to a temp. of -28° C. (i) and (ii) frozen carcasses packaged in polyethylene bags were stored at -20° C; batches of 30 were examined directly after freezing and after storage for 3, 6 or 12 months, defrosting being in a water-bath at 30° C, and a batch of 30 fresh carcasses was also examined. Breast and thigh muscles were taken from the carcasses with skin and subcutaneous fat, and each pair of breast or thigh muscles was examined separately after thorough mincing. Total N, fat, ash, and non-protein N contents, acid value and peroxide value of rendered fat, meat pH, heat shrinkage, and taste, aroma, tenderness and juiciness of meat roasted at 170° C for 45 min were determined. It is concluded from graphically presented results that (ii) resulted in lower defrosting losses of stored samples; that there was no appreciable difference between (i) and (ii) in rate of increase of non-protein N during storage; that greater increases in peroxide value during storage of (ii) than of (i) were due not to differences in freezing method but to the fact that (ii) were packaged in bags after freezing, while (i) were frozen already packaged; and that there were no differences in organoleptic quality between (i) and (ii). SKK

51

A study on the utilization of ducks into some processed products.

Madlansacay, P. L.; Rivera, L. S.; Aducaen, T. R.; Contreras, E. S.

Philippine Journal of Nutrition 30 (2) 59-65 (1977) [6 ref. En]

Mallard and Muscovy ducks were employed to assess the dressing values for duck, and to determine their suitability for replacing chicken in some recipes. Muscovy ducks dressed out at 69%, and commercial and University-raised mallards at 57% and 50%, resp. Whole cured carcasses showed no significant differences in flavour and acceptability, but mallard had a different colour to Muscovy duck, perhaps due to greater cured-colour development in the former. Addition of phosphate (0.5%) improved yield, and improved quality for ≤ 1 wk of frozen storage. Duck incorporated into 2 canned recipes (adobo and estofado) produced highly acceptable products. JRR

52

Curing and smoking poultry products.

Mast, M. G.

World's Poultry Science Journal 34 (2) 107-111 (1978) [6 ref. En] [Coll. of Agric. Extension Service, Pennsylvania State Univ., University Park, Pennsylvania, USA]

Curing processes in general are briefly described, and methods and recipes for the preparation of cured/smoked poultry products are given. Brine curing should take place at $\leq 40^\circ$ F, after which birds should be washed thoroughly and dried. Smoking time and temp. are variable, depending on the degree of smoked flavour desired, but an internal temp. of $\geq 155^\circ$ F must be achieved for ready-to-eat products; the cooking process may be finished in a conventional oven. Hickory, apple, peach, maple, plum or ash woods may

be used to produce the smoke; any non-resinous wood is suitable. Products must be refrigerated, giving a shelf-life of ≤ 2 wk; longer periods should involve frozen storage at 0° F (≤ 4 months before deterioration of flavour takes place). JRR

53

Vitamin E supplement benefits poultry and consumer. I. [Review]

Marusich, W. L.

Feedstuffs 50 (50) 20-22 (1978) [41 ref. En] [Hoffmann-La Roche Res. Div., Nutley, New Jersey, USA]

Aspects covered in this review include: the metabolic role of vitamin E; effects of dietary tocopherol levels on tocopherol concn. in edible tissues of broilers and turkeys; the role of tocopherol as an antioxidant, preventing rancidity and hence flavour defects in frozen or refrigerated poultry; and the potential for use of dietary tocopherol supplements to minimize 'fishy' off-flavours in poultry fed diets containing fish meal. Numerous tables of literature data are given. AJDW

54

[Heat treatment of poultry.] Wärmebehandlung von Geflügel.

Buriankova, J.

Fleisch 32 (9) 175-177 (1978) [De] [Res. Inst. for the Poultry Ind., Bratislava, Czechoslovakia]

Comparative studies were conducted on various cooking methods for poultry: microwave heating, cooking in a convection oven, cooking in water, pressure cooking, and roasting by means of radiant heat. The required heat treatment times and the resultant wt. losses were determined, together with juiciness (evaluated organoleptically and by measurement of dry wt.). Cooking in water under pressure gave the best results; cooking times were 10-15 min for chickens, 20 min for ducks, and 30 min for turkeys. Yield is high, especially for chickens, and the juiciness is good as a result of water uptake during cooking. Convection ovens gave the best results in roasting trials; microwave roasting has the advantage of rapidity, but is only suitable for use in high-capacity processing lines. IN

55

Effect of radurization on the chemical, microbiological and organoleptic characteristics of poultry meat. (In 'Food preservation by irradiation' [see FSTA (1979) 11 4G311]) [Lecture]

El-Wakeil, F. A.; El-Magoli, S. B.; Salama, N. A. M. I, 467-480 (1978) [23 ref. En] [Dep. of Food Sci. & Tech., Fac. of Agric., Cairo Univ., Cairo, Egypt]

The effect of pretreatment with salt solution (2.5% NaCl + 0.25% $Na_5PH_3O_{10}$) and irradiation doses of 0.5, 1.0 or 1.5 Mrad on the chemical, microbiological and acceptability characteristics of chicken meat was evaluated. A shelf-life extension of 4 wk with satisfactorily acceptable scores was obtained at 1.5 Mrad. Salt pretreatment improved acceptability scores, even at 0.8 Mrad after 4 wk. The microbial level directly after irradiation was reduced by about 80-95% in all the samples investigated. The rate of bacterial

growth increased during storage and reached a max. of $10^5/g$ at 0.8 Mrad in the pretreated samples; at this level the samples were still acceptable. No irradiated samples showed *Escherichia coli* or faecal streptococci, although both were found in the controls. Irradiation apparently resulted in a net increase in the free amino acids, which increased from about 0.67 in the control to about 1.9 after 4 wk of storage. This increase was clearer in lysine, methionine and valine. On the other hand, salt pretreatment revealed the same trend, reaching about 1.2 especially in glutamic acid, aspartic acid, histidine, methionine and valine. 0.8 Mrad failed to prolong the shelf-life as thiobarbituric acid (TBA) values increased significantly and rendered the flesh unacceptable after 2 wk. Higher radiation doses, ie. 1.0 and 1.5 Mrad, kept the TBA values and consequently the organoleptic properties within the acceptable range, even after 4 wk storage. The use of salt and sodium pyrophosphate clearly lowered the TBA values even at 0.8 Mrad. However, the TBA values at the end of the shelf-life did not exceed the normal range for unspoiled meat. AS

56

The effect of strain, sex and diet on growth and carcass characteristics of meat-type ducks.

Bagot, I.; Karunajeewa, H.

Australian Journal of Experimental Agriculture and Animal Husbandry 18 (93) 527-532 (1978) [9 ref. En] [Dep. of Agric., Werribee, Victoria, Australia]

42 (i) Commercial Pekin and 42 (ii) Pekin \times White Orpington ducks were reared to 9 wk of age on either a high (H) or a low (L) plane of nutrition. Tables of results are given, including data for carcass quality, meat yield and cooking loss. The results show that the higher plane of nutrition gave higher eviscerated wt., giblet wt., and wt. before chilling; breed did not significantly influence carcass quality except that (ii) had higher dressing % than (i) on L diets, whereas the reverse was true on H diets. Sex had little effect on carcass quality, except that there was significant interaction between sex and diet for dressing %. Breed and plane of nutrition had no significant effect on cooking loss or wt. of cooked carcass components. Carcasses of males had higher ready-to-cook wt. and cooked wt. than carcasses of females. AJDW

57

Water and polyphosphates in QF foods.

Saltey, M.

Frozen Foods 31 (11) 22, 24 (1978) [En]

The position with regard to added water and polyphosphates in quick frozen foods, particularly poultry, is discussed, including advantages claimed and suggestions for labelling. AL

58

Estimating the endogenous water content of frozen eviscerated duck carcasses.

Carter, T. C.; Clayton, G. A.

British Poultry Science 18 (6) 695-698 (1977) [3 ref. En] [Poultry Res. Cent., West Mains Road, Edinburgh EH9 3JN, UK]

Statistical analysis of data from a small sample of duck carcasses, ranging in wt. from 1.1 to 2.2 kg, which

had been bled, wet-plucked and eviscerated and from which the heads and feet had been removed, but which had not subsequently been through a spray, slush-tank or spin-chiller before being frozen, showed that the water content could be predicted from knowledge of the protein content alone. The s.d. of the difference between the predicted amount of water and the amount found by analysis of an independent sample of carcass homogenate was 1.8% of the mean carcass wt. Accuracy of prediction was scarcely affected by taking account of the mineral content of the carcass and was unaffected by fat content. AS

59

[Effect of processing method on the quality of poultry meat in the course of storage.]

Rassadkina, E. A.; Lubyanskiy, S. A.

Kholodil'naya Tekhnika No. 6, 35-37 (1978) [9 ref. Ru] [Voronezhskii Tekh. Inst., Voronezh, USSR]

Changes in the muscle and fat tissue of hens as a result of various processing methods (manual or mechanical) followed by freezing at -25°C and storage at -18°C are discussed. Quality was evaluated on the basis of water binding capacity, moisture content, myosin solubility, acidity value, peroxide value, and the concn. of various N fractions. The results show that processing influenced the rate of autolytic changes, which were most intense for mechanical processing. STI

60

Poultry processing.

Meyn, P.

British Patent 1 518 208 (1978) [En]

Apparatus is described for cutting open poultry bodies suspended by their ankle joints from an overhead conveyor, in preparation for removal of the intestines. IFT

61

A selective medium for the rapid isolation of pseudomonads associated with poultry meat spoilage.

Mead, G. C.; Adams, B. W.

British Poultry Science 18 (6) 661-670 (1977) [26 ref. En] [Food Res. Inst., Colney Lane, Norwich NR4 7UA, UK]

A new selective medium (CFC) has been developed for the rapid isolation of pigmented and non-pigmented pseudomonads associated with the spoilage of poultry meat held under chill conditions. It comprises Difco Heart Infusion Agar supplemented with 50 μg cephaloridine, 10 μg fucidin and 10 μg cetrimide/ml. CFC medium was found to be more selective than 3 other media which have been used for isolating pseudomonads from foods, when tested with pure cultures of 28 reference organisms. CFC supported the growth of a higher proportion of pseudomonads from freshly-eviscerated carcasses and processing equipment when the organisms were present only in low numbers relative to other genera. AS

62

Electrophoresis of avian muscle proteins.

Wilkinson, C. C. L.; Jones, J. M.

British Poultry Science 19 (2) 243-247 (1978) [6 ref. En] [Food Res. Inst., Colney Lane, Norwich NR4 7UA, UK]

Polyacrylamide gel electrophoresis was used to examine the water-soluble proteins from 8 identified muscles of the domestic fowl, turkey and duck in order to establish the variation between the same muscles of different species. 2 breast muscles, one back muscle and 5 leg muscles were used in the study. The electrophoretic patterns of water-soluble proteins of the muscles showed differences due both to species and to muscle type. Each muscle pattern within a species showed a unique protein band which distinguished that species from other species. It is concluded that while any of the skeletal muscles may be used as a standard for identifying the economically important avian spp., the positive identification of a sp. is dependent upon careful measurement of the mobility of only 1 protein zone. VJG

63

[Principles of microbiology, hygiene and sanitation at meat and poultry processing plants.] Osnovy mikrobiologii, gigeny i sanitarii na predpriyatiyakh myasnoi i ptitsepererabatyvayushchei promyshlennosti. [Book]

Kostenko, Yu. G.; Netseplyaev, S. V.

160pp. (1978) [11 ref. Ru.] Moscow, USSR; Pishcheyaya Promyshlennost'. Price 0.25r

This textbook for specialist technicians includes the following chapters: Fundamentals of microbiology in meat and meat products processing (pp. 8-46); Sanitary assessment of livestock carcasses and poultry infected with contagious diseases, food poisoning and intestinal diseases (pp. 46-76); Sanitary and hygienic requirements for the site and equipment of meat and poultry processing plants (pp. 76-98); and Sanitary and hygienic requirements for the production processes at meat and poultry processing plants (pp. 98-158). STI

64

[Poultry carcass cooling using air stream and intermittent application of water mist.]

Matyniak, J.; Jeske, J.; Wcislo, H.; Stanislawiak, M. *Przemysl Spozywczy* 32 (5) 188-190 (1978) [10 ref. Pl, ru, en, fr, de] [Centralny Osrodek Badawczo-Rozwojowy Drobiarstwa, Poznan, Poland]

Cooling of (i) chicken (wt. 1.0-1.2 kg), (ii) duck (wt. 1.6-1.7 kg) and (iii) goose (wt. 4.1-4.9 kg) carcasses was studied under laboratory conditions using a stream of air at 8-10°, 0° or from -3.5° to -5° C and intermittent application of water mist at 0-15° C for varying lengths of time. It is concluded from tabulated results that best conditions for cooling and maintenance of satisfactory external appearance were provided by cycles of intermittent treatment with air stream at temp. of between -3° and -5° C for 90 s followed by water mist spray at 15° C for 10 s. This procedure enabled cooling of (i) carcasses from about 30° to about 6° C in approx. 35 min, of (ii) carcasses from about 31° to about 7° C in approx. 35 min, and of (iii) carcasses from about

35° to about 10° C in approx. 45 min. Wt. gain of carcasses was $\leq 0.4\%$, cooling water consumption was 7 \times lower than in ice water cooling, and skin condition was better. SKK

65

Quality assurance programs for meat and poultry inspection and processing. [Lecture]

Angelotti, R.

Food Technology 32 (10) 48-50 (1978) [En] [Food Safety & Quality Service, USDA, Washington, DC 20250, USA]

The inspection of slaughter and processing operations for meat and poultry in the USA is carried out either by the Federal government or by individual states. It is expected that in the future most states will hand their inspection programmes to the Federal Government. This, together with the increase in numbers of meat and poultry plants, will dramatically increase the number of Federal inspectors required. The authors suggest that, in order to decrease the requirement for inspectors, more efficient inspection methods be developed and that the Meat and Poultry Inspection Acts be amended. They challenge the current inspection system and review past and present inspection procedures for slaughter and further processing operations. It is concluded that continuous inspection during slaughter is essential. Means are suggested by which further processing operations can be continuously supervised at a low cost and without the need for more inspectors. These means include the adoption of quality assurance programmes (in which plant personnel act as inspectors) and basing the need for Federal inspection on the potential health risks and economic hazards associated with each process/product combination. The requirements for quality assurance programmes are briefly discussed. [See FSTA (1979) 11 36C315.] JA

66

Quality and pigmentation of the broiler skin.

Scholtyssek, S.

World's Poultry Science Journal 34 (4) 222-229 (1978) [14 ref. En, fr, de] [Univ. Hohenheim, 7000 Stuttgart 70, Federal Republic of Germany]

After a general introduction on quality criteria for poultry and the importance of visual acceptance, recommendations are made on methods of intensifying skin pigmentation. This can be done by adding carotenoids (from egg yolk) to the feed. Pigment measurement may be done with special colour fans or a colour difference meter. The literature on the effects of pigments from natural or synthetic sources and of genetic origin of the birds on skin pigmentation is briefly reviewed. JRR

67

[Evaluation of changes in the quality of poultry meat products by the TBA and benzidine numbers.]

Fiedler, A.; Matyniak, J.; Sproczynski, E.

Przemysl Spozywczy 32 (5) 190-191 (1978) [8 ref. Pl, ru, en, fr, de] [Centralny Osrodek Badawczo-Rozwojowy Drobiarstwa, Poznan, Poland]

Commercial Leszczyny sausages containing 40% chicken meat were stored at -20°C for 6 months. Contents of malonic aldehyde ($\mu\text{g/g}$) determined by the thiobarbituric acid (TBA) test of Holland [FSTA (1972) 4 2J231] and contents of cinnamic aldehyde ($\text{mg}/100\text{ g}$ fat) determined by the benzidine method of Toth [FSTA (1972) 4 12S1646] were, resp.: initially 0.12 and 3.15, after 1 month 0.16 and 3.69, after 3 months 0.36 and 6.47, and after 6 months 1.02 and 15.47; the sausages tasted rancid after 3 months. Turkey breast muscles and leg muscles + skin were minced, sealed in 200 g cans and (i) heated in boiling water for 1 h, or (ii) baked at 160°C for 1 h, or (iii) heated as for (i), and stored after can opening for 72 h at 4°C . Malonic and cinnamic aldehyde contents were, resp.: initially 2.06 and 37.99, after (i) 0.34 and 109.27, after (ii) 0.66 and 66.98, and after (iii) 2.78 and not stated; rancid taste and odour were detected after (iii). Further tests with turkey meat confirmed the marked decrease in malonic aldehyde content brought about by heat treatment. It is concluded that qualitative changes in poultry meat are best studied by a combination of TBA and benzidine tests in parallel with sensory analysis. SKK

68

Variation of muscle and fat criteria and their possible effects on the quality of frozen meat. (In 'Frozen and quick-frozen food' [see FSTA (1979) 11 6G440]) [Lecture]

Schön, I.

pp. 77-101 (1977) [8 ref. En] [Fed. Meat Res. Inst., Kulmbach, Federal Republic of Germany]

Variation in muscle and fat composition of carcasses, and exogenous and endogenous factors (sex, age, wt., food composition etc.) and physiological and technological reactions (health aspects, nutritional-physiological valuation, etc.) which interact with carcass composition and ultimately affect the quality of frozen meat are discussed. Beef, pork, lamb and poultry are also discussed separately with respect to effects of changes in constituents of muscle and fat, and age of the animal at slaughter on the quality of frozen meat. SP

69

[Refrigeration of poultry.]

Letang, G.

Revue Generale du Froid 69 (9) 533-541 (1978) [14 ref. Fr]

The following aspects of chilling of poultry are reviewed: technical problems (time of the procedure, heat transfer); and chilling processes, including classical cold chamber method, continuous fast air chilling, continuous spin chilling, spray chilling, combined spin chilling and pulsed air chilling, vacuum chilling, and dry ice (CO_2) chilling. Diagrams are used to illustrate some of the processes. RM

70

[Receptacle for packaging and presentation of fowl, game or the like.]

Renaissance Conseil

French Patent Application 2 378 686 (1978) [Fr]

The receptacle, shaped by heat moulding of polystyrene, consists of 2 boat shaped sections

connected down 1 edge, such that 1 section folds over the other and locks by means of a press stud. The base portion is deep and ridged; the upper part is in the form of a pinched-in dome designed roughly to accommodate the shape of the bird. W&Co

71

[Applications of solvent fractionation of poultry fats.] (In 'Proceedings of the 13th World Congress' [see FSTA (1979) 11 7N294]) [Lecture]

Catalano, M.

pp. 41-51 (1976) [Fr] [Inst. des Ind. Agric., Univ. d'Etat, Bari, Italy]

Waste products arising from slaughter and commercial processing of poultry amount to 300-500 g/bird, of which 12-15% is fat which could be recovered for food purposes. Detailed analyses (by chromatography) are reported of fatty acids composition, % of saturated and unsaturated acids, non-saponifiable matter, triglyceride (TG) composition, and cholesterol content of poultry fat and of the 2-monoglycerides (MG) obtained by hydrolysis with pancreatic lipase. Results (mean, max., min.) are tabulated. Differences between chicken and turkey fat were small. Poultry fat contained a smaller proportion of saturated acids than other animal fats. MG had a high level of unsaturation, giving a high % of mono- and dienoic acids. TG contained 0-5 double bonds, with diunsaturated TG accounting for 27% and triunsaturated for 40%; the product is semi-fluid at atm temp. Fractional crystallization from 85:15 v/v acetone:n-hexane was studied at -5°C and -10°C . Detailed data are tabulated for original fat and various solvent/temp. fractions showing soluble and insoluble contents, fatty acid composition, proportions of saturated and unsaturated acids, cholesterol content, softening and clarification temp. It is possible to separate (at -10°C) a fluid fraction (very suitable for cooking oil) and a smaller fraction, which is hard at ambient temp. ELC

72

Improvements to devices for gripping animals or objects.

France, Societe d'Etudes et de Recherches pour l'Aviculture Moderne 'Avirem'

British Patent 1 525 373 (1978) [En]

Quick action grapple apparatus is described for use with an overhead conveyor which employs lever mounted jaws actuated by the wt. of the suspended poultry. IFT

73

[Use of contact plating for bacteriological evaluation of cleaning at meat processing plants and poultry slaughterhouses.]

Mukherji, S.

Dansk Veterinaertidsskrift 61 (8) 384-388 (1978)

[9 ref. Da] [Landbrugsmin. Slakteri og Konserverlab., Howitzvej 13, 2000 Copenhagen F, Denmark]

Comparative studies on detn. of the hygienic quality of cleaned surfaces in a ham processing plant, a slaughter line, a meat freezing plant and poultry slaughterhouses by the (i) agar sausage and (ii) contact

plate methods were carried out. Tables of comparative data for the 2 methods are given, presented as the % of impressions with ≤ 10 , 11–30, 31–100 or > 100 colonies. The results show the % of impressions with > 100 colonies to be greater for (ii) than for (i), the difference being greatest for surfaces of poor hygienic quality. This difference is explicable on the basis of the greater surface area of (ii) impressions. The relative merits of (i) and (ii) are discussed. It is suggested that both techniques should be used: (i) for small, irregular-surfaced items, and (ii) for large, flat surfaces. AJDW

74

[Cooling apparatus.] Kühlvorrichtung
Sass, K.; Göbel, H.; Boeck, G. (Ahlmann – Sanitär- und Kunststofftechnik GmbH)

German Federal Republic Patent Application
2 716 021 (1978) [De]

A cooling box is provided to keep fresh foods, such as meat or poultry, at a controlled temp. between 1° and 7°C during transport, e.g., from wholesaler to retailer. The transport vessel, charged with prechilled meat, contains a movable cooling box filled with dry ice and having a throttle controlled to open wider when the temp. rises above a prearranged value. W&Co

75

Quality evaluation of four methods of producing frozen poultry parts.

Goddard, M. S.; Heath, J. L.

Journal of Food Science 43 (6) 1662–1665 (1978)
[20 ref. En] [Poultry Sci. Dep., Univ. of Maryland, College Park, Maryland 20742, USA]

The objective of this research was to compare 4 methods of producing frozen poultry portions. Portions were chilled either in tap or ice water and blast frozen, or chilling was by-passed with portions frozen in blast, Freon or liquid N_2 freezers. Liquid N_2 frozen portions had the least bone darkening. Immersion chilled portions had the greatest amount of lipid oxidation. Shear press analysis showed an equal degree of tenderness for all freezing methods. Results of a taste panel analysis indicated that panel members preferred the hot-cut, immersion chilled portions, but that poultry frozen immediately after hot cutting is an acceptable product. IFT

76

[Goose production and slaughter in relation to carcass quality.]

Gey, K.

Fleisch 32 (10) 193–194 (1978) [De] [VEB Geflügelwirtschaft Bezirk Leipzig, Sitz Mutzschen, German Democratic Republic]

A recent trend towards slaughter of young geese is discussed; problems include low carcass wt., an excessive proportion of feather residues after slaughter, and lower proportions of thigh and breast meat. Trends in slaughter goose production in the Leipzig district are discussed. Measures suggested for improvement of carcass quality include: use of high quality crossbred birds; separate rearing and slaughter of the sexes (slaughter at 57–59 days of age for females, 59–62 days

of age for males); transport in cages; starvation for 4 h before slaughter; slaughter without delay (to minimize stress); and use of different scalding temp. and plucking times for the 2 sexes. Application of these measures is likely to increase % breast meat, carcass yield and the proportion of Class I carcasses, and to reduce losses during transport. The potential for further improvement of carcass quality is discussed. IN

77

Nutrient requirements of ducks. (In 'Proceedings 1978. Cornell Nutrition Conference for Feed Manufacturers' [see FSTA (1979) 11 7A487]) [Lecture]

Dean, W. F.

pp. 132–140 (1978) [10 ref. En] [Duck Res. Lab., Cornell Univ., Eastport, Long Island, New York, USA]

In this review on nutrition requirements of ducks the effects of dietary energy and protein on carcass fat and younger slaughter age on carcass composition were evaluated. It is proposed that an increase in body wt. at a given age causes an increase in carcass fat and that % of lean breast is reduced substantially as the slaughter age is decreased. SP

78

[Evaluation of degree of rancidification of poultry fat.]

Sroczyński, E.; Fiedler, A.

Przemysł Spożywczy 32 (11) 420–421 (1978) [5 ref. Pl, ru, en, fr, de] [Badawczo-Pozwojowy Drobiarstwa, Poznań, Poland]

Homogeneous samples of muscle with skin of six 9-wk-old Peking ducks were examined (i) fresh, after UV irradiation for (ii) 2 or (iii) 4 h, or after keeping at 25°C for (iv) 24 or (v) 48 h. Further tests were carried out with samples stored for 3 or 7 months at -18°C . Fat was extracted from individual samples with diethyl ether, and free fatty acids were separated by TLC according to Fishwick [FSTA (1969) 1 1S51], the hexane/diethyl ether/acetic acid proportions of the developing liquid being changed from 79/20/1 to 80/20/2. The separated free acids were determined by measurement of extinction of the coloured compound formed by reaction between their Cu salts with sodium diethyldithiocarbamate. Tests with highly rancid meat showed that the method was accurate and gave repeatable results. Mean values for free fatty acid contents of (i)–(v) were resp. (mg/100 g fat): 116.8, 147.6, 178.9, 545.0 and 1632.8; organoleptically, (iv) samples indicated protein decomposition, and (v) samples were found unsuitable for consumption. Contents of free fatty acids in the frozen samples were initially and after 3 and 7 months of storage, 167.8, 272.9 and 336.4 mg/100 g fat resp.; taste and aroma decreased progressively. It is considered that detn. of free fatty acids is an objective and sensitive method for quality evaluation of poultry fat. SKK

79

Characteristics of six patty formulas containing different amounts of mechanically deboned broiler meat and hand deboned fowl meat.

Lyon, B. G.; Lyon, C. E.; Townsend, W. E.

Journal of Food Science 43 (6) 1656-1661 (1978) [23 ref. En] [Anim. Products Composition & Utilization Res. Unit, USDA-SEA, Richard B. Russell Agric. Res. Cent., PO Box 5677, Athens, Georgia 30604, USA]

6 patty formulas containing mechanically deboned broiler meat (MDBM), hand deboned fowl meat (HDFM) and structured protein fibre (SPF) from soy were evaluated for proximate composition, rancidity, colour, force to shear, and sensory profiling by quantitative descriptive analysis. As level of MDBM decreased, moisture and protein contents, L-values (lightness) and shear values increased correspondingly; fat content, a_1 values (redness) and thiobarbituric acid values decreased; and products were perceived as being lighter, more chewy and elastic, and less juicy. Interchangeable ratios of 40:60/60:40 MDBM and HDFM can be incorporated with SPF to yield products of good quality. IFT

80

Effect of preslaughter fasting and postslaughter ice-chilling on the dressing yield of White Pekin ducks. Gupta, S. C.; Aggarwal, C. K.; Pal, R. N.; Panda, P. C. *Haryana Agricultural University Journal of Research* 8 (3) 210-215 (1978) [10 ref. En] [Dep. of Livestock Production & Management, Haryana Agric. Univ., Hissar, India]

288 White Pekin ducks (7-12 wk old) were divided into small (1000-1500 g), medium (1500-2000 g) and large (2000-2500 g) live wt. groups. Within these groups, birds were subjected to 0, 12, 18 or 24 h preslaughter fasting; the carcasses were chilled in slush ice for 6, 8, 10, 12 or 16 h. Effects of live wt. and fasting on carcass quality and effects of duration of slush ice chilling on carcass wt. were evaluated; tables of results are given. Large and medium birds had higher dressing % and ready-to cook % but lower viscera and giblets % than small birds. Large birds had the highest % meat. Dressing and ready-to-cook % tended to decrease with increasing fasting time; % body wt. losses decreased with increasing initial body wt. Carcass wt. increased with increasing slush-ice chilling time, the % increase being greatest for small birds; wt. increase during chilling increased with increasing duration of pre-slaughter fasting. AJDW

81

[Changes in the quality of meat of frozen guinea fowl during storage.]

Ivashchenko, V. I.; Lizunova, V. V.; Veitsman, L. N.; Petrova, V. D.; Oliferenko, E. I. *Kholodil'naya Tekhnika* No. 7, 43-45 (1978) [1 ref. Ru] [Novosibirskii Inst. Sovetskoi Kooperativnoi Torgovli, USSR]

Optimal storage periods were determined on the basis of changes in sensory and chemical indexes of the meat during storage. Some of the birds were packaged in polyethylene (PE) before storage. The fowl were kept at -18°C and 85% RH. Of the sensory properties, the colour, consistency, condition of surface, and smell were determined; the presence of NH_3 , ammonium salts, and amine N, peroxidase activity, acid number and iodine number of fat were determined, and the freshness of meat was investigated microscopically. Oxidation was

slow in fat tissue at low temp. The PE-wrapped fowl can be kept for 4 months; unwrapped fowl can be stored for ≤ 2 months. Darkening, (typical of the guinea fowl) during freezing disappears after thawing. STI

82

[New slaughter animal and meat inspection regulations in Austria.] Zur Neuregelung der Schlachtvieh- und Fleischbeschau in Österreich. Prändl, O.

Wiener Tierärztliche Monatsschrift 65 (12) 360-367 (1978) [De, en] [Vet. Med. Univ., Linke Bahngasse 11, A-1030 Vienna, Austria]

The draft of an amended Austrian Meat Inspection Act provides a number of new and amended regulations including: possibility of extension of mandatory inspection to game and poultry; separation of slaughter of diseased animals (in different rooms or at different times); mandatory skinning of carcasses (except pigs); introduction of the terms 'fit after adequate treatment' and 'meat of inferior quality after adequate treatment' in place of 'conditionally passed'; expanded range of cases where the entire carcass is condemned as unfit for human consumption; marking of condemned meat; provisions governing sanitary conditions; reinspection of meat in domestic trade and of imported meat; and mandatory meat inspection records. In addition, residue analysis, supervision of slaughter hygiene, and Trichina control are discussed. Min. and max. inspection times/carcass are recommended. RM

83

[Improvement in packaging trays.]

Societe Civile d'Exploitation Agricole La Caille des Vosges

French Patent Application 2 384 678 (1978) [Fr]

A cut-out blank of cardboard or plastics which folds up into a rectangular dish with shallow sloping sides is additionally provided with an extra flap or wing which when folded up provides a curved attachment hinged along the length of one of the sides; this can be used for recording information about the fowl placed on the dish. The whole may be then covered with a protective film. W&Co

84

Mechanically deboned red meat, poultry, and fish. United States of America, Institute of Food Technologists

Food Technology 33 (3) 77-79 (1979) [21 ref. En] [221 N. LaSalle Street, Chicago, Illinois 60601, USA]

The scientific status of mechanically-deboned red meat, poultry and fish is reviewed. The mechanical deboning process and mechanically deboned meat products are briefly described. The regulation of the use of mechanically deboned meat, the safety of using mechanically deboned meat viz. bone fragments, pesticide and antibiotic residues, trace elements and microbial hazards and the nutritive value of mechanically deboned meat are discussed. SP

85

Effects of CO₂-snow on the quality and acceptance of mechanically deboned poultry meat.

Mast, M. G.; Jurdi, D.; MacNeil, J. H.

Journal of Food Science 44 (2) 346-349 (1979) [En]
[Dep. of Food Sci., Pennsylvania State Univ., University Park, Pennsylvania 16802, USA]

Mechanically deboned chicken meat (MDCM) and mechanically deboned turkey meat (MDTM) were chilled with CO₂-snow, frozen, and stored at -20° C for ≤ 48 wk. MDCM exposed to CO₂ generally exhibited higher thiobarbituric acid (TBA) values and peroxide values (PV) than control samples (no CO₂). TBA values of treated and untreated MDTM were similar; however, PV of CO₂-treated MDTM were consistently higher. Meat exposed to CO₂ was initially redder than untreated meat; however during later stages of frozen storage, control samples were redder. Taste panelists were able to discriminate among the various treatments. Meat chilled with CO₂ was generally preferred to control samples and meat frozen with CO₂; control samples were usually preferred to CO₂-frozen samples. IFT

86

Effect of microwave energy on poultry tenderness.

Dunn, N. A.; Heath, J. L.

Journal of Food Science 44 (2) 339-342 (1979) [En]
[Dep. of Poultry Sci., Univ. of Maryland, College Park, Maryland 20742, USA]

This research determined if exposure of pre-rigor muscle to microwave energy would inhibit glycolysis and improve tenderness. Broiler muscle was exposed to microwaves for 0, 1.06 and 2.12 s/g and aged for 0, 30, 60 or 120 min prior to detn. of glycogen and ATP. Tissue used for sensory and shear evaluations was subjected to 0.9 s/g at 160° C in a conventional oven, 0.5 s/g in a microwave oven, or to an internal temperature of 77° C, in a conventional or microwave oven. Microwave treatment resulted in decreased glycogen metabolism but had no effect on the retention of ATP. Sensory and shear evaluations indicated that all treatments resulted in less tender samples. IFT

87

Stability of ozone and its germicidal properties on poultry meat microorganisms in liquid phase.

Yang, P. P. W.; Chen, T. C.

Journal of Food Science 44 (2) 501-504 (1979) [En]
[MAFES, Poultry Sci. Dep., Mississippi State Univ., Mississippi 39762, USA]

O₃ was produced using a Welsbach ozonator and measured by an iodometric titration method. The stability of O₃ in water depended on water temp., initial O₃ concn. and length of holding time. In general, O₃ was more stable in water at 2° C than in water at 25° C. % of O₃ retained after standing were similar for initial concn. which ranged from 3.15 to 4.65 mg/l. The germicidal effects of O₃ were affected by contact time, temp., pH value and presence of inorganic and organic materials in the solution. Longer contact time, lower pH value and lower temp. resulted in greater bactericidal effect. The bactericidal effects of O₃ were reduced in Ringer

solution, 5% NaCl solution and in the presence of egg albumen in solution. IFT

88

A review and testing of selective media for psychrotrophic bacteria. [Review]

Brant, A. W.; Mulder, R. W. A. W.; Dorresteyn, L. W. J.; Pelgrom, R. F. M.

Poultry Science 57 (5) 1272-1278 (1978) [31 ref. En]
[Dep. of Food Sci. & Tech., Univ. of California, Davis, California 95616, USA]

A thorough review of the literature revealed numerous selective media developed for culturing psychrotrophic food spoilage bacteria. Diamide (diazenedicarboxylic acid bisdimethylamide), cetrimide (cetyltrimethylammonium bromide), or cephaloridine were added to 2 nutrient media and 8 media previously reported for selectively culturing pseudomonads and other psychrotrophic spoilage bacteria of foods. 4 strains of bacteria associated with poultry spoilage and 9 strains suspected of interfering with the selectivity of the media were cultured. The addition of 0.025% diamide inhibited all the unwanted strains tested except *Pseudomonas aeruginosa*. It also inhibited *P. fragi* but permitted growth of *P. fluorescens* and *P. putida*. Cetrimide at 10 p.p.m. allowed the growth of *P. fragi* but did not inhibit *Enterobacter* strains. Cephaloridine inhibited *E. coli* and *Proteus vulgaris* while permitting growth of *P. aeruginosa*, *fluorescens*, and *putida*. AS

89

Quality of patties containing mechanically deboned broiler meat, hand deboned fowl meat and two levels of structured protein fiber.

Lyon, C. E.; Lyon, B. G.; Townsend, W. E.

Poultry Science 57 (1) 156-162 (1978) [13 ref. En]
[Anim. Products Util. & Marketing Res. Lab., USDA, Richard B. Russell Agric. Res. Cent., Athens, Georgia 30604, USA]

Structured soy protein fibres (SPF) at 8 and 16% levels were incorporated into 2 poultry patty formulations containing mechanically deboned broiler meat (MDBM) and hand deboned fowl meat (HDFM). A third formula composed of MDBM and HDFM with no SPF served as a control. The soy product was a flesh-like fibre structured from soy isolate. Ingredients were mixed, ground and stuffed into casings. Products were tempered to -3° C, sliced and stored at -40° C for ≤ 8 wk. Quality characteristics measured were colour (Hunter Color and Color Difference Meter), texture (Instron), and cook loss. A 12-member trained panel characterized the products by Quantitative Descriptive Analysis (QDA). Frozen and heated patties exhibited darker (lower L value) and redder (higher a_L value) appearance as level of SPF decreased. Texture, measured by force to shear a 2.5 cm slice, increased from 2.10 to 2.57 kg as level of SPF increased from 0 to 16%. Cook losses, evaporative and drip, were greatest in patties with 0% SPF (36.11%) and least in patties with 16% SPF (30.32%). Panelists characterized the patties with 0% SPF as more chewy and elastic, coarser in particle size and shape, and more moist than the other products. Patties with 0 and 8% SPF ranked highest for overall impression, scoring 37.6 and 37.0 resp. on a 0-60 QDA scale. AS

90

Electrical terminology, measurements and units associated with the stunning technique in poultry processing plants.

Ingling, A. L.; Kuenzel, W. J.

Poultry Science 57 (1) 127-133 (1978) [6 ref. En] [Dep. of Vet. Sci., Univ. of Maryland, College Park, Maryland, USA]

A variety of possible electrical circuits can be fabricated to stun poultry in processing plants. At the present time a lack of uniformity in terminology exists when describing the electrical features of stunners. Electrical output from several stunners is described including: AC, 60 Hz; AC, variable frequency; and pulsed DC. In addition sine wave and rectangular wave outputs are compared. When measuring the voltage output of sinusoidal and full-wave rectified sinusoidal waveforms, the average value is 0.636 times the peak value and the effective value is 0.707 times the peak value. For half-wave rectified sinusoidal waveforms, the effective value is 0.50 times the peak value and the average is 0.318 times the peak value. For rectangular AC waveforms, with no off-time, the peak, average, and effective values are all equal. A procedure is described for determining the output of a given stunner within a poultry processing plant. 2 instruments are required, a multimeter and a cathode ray oscilloscope. The procedure includes an accurate description of the waveform output and a direct measure of the peak, average, and effective voltage used to stun poultry. AS

91

Spray smoking of bacon and poultry.

Anon.

International Flavours and Food Additives 9 (6) 262, 266 (1978) [En]

A description is given of the first commercially available range of automatic electrostatic spray smoking plants for bacon and other meats. Each new plant, now being introduced by Stewart Gill & Co. Ltd., consists of an overhead conveyor system to transport the product at a constant speed through the process, 2 electrostatic spray guns, which are either fixed or mounted on automatic reciprocating units, and conditioning and drying chambers. A range of bacon smoking plants with throughputs of between 10 and 200 t/wk has been designed. Because of the speed of the process and the relatively low temp. rise involved, the wt. losses are extremely low, usually of the order of 0.5-1.5%. Advantages of the system are: substantial savings in initial capital outlay and operating costs; increased yield on account of low wt. losses; flavouring losses are very low; and effluent air from the process is free of any objectionable odour. The first processor to operate one of the new plants John Wragg Ltd., of Sheffield, has a cycle time of about 90 min, and on single shift working is capable of producing 500 pieces of smoked bacon/wk. VJG

92

A method and apparatus for packing poultry in bags.

BRDR. Schur International A/S

British Patent 1 525 559 (1978) [En]

A method is described for packaging oven ready chickens and poultry in plastics bags which uses pushers

and a narrowing channel to compress the birds for passage through the zone of constriction in the package. IFT

93

Potential application of microbial antagonism to extended storage stability of a flesh type food.

Raccach, M.; Baker, R. C.; Regenstein, J. M.; Mulnix, E. J. *Journal of Food Science* 44 (1) 43-46 (1979) [22 ref. En] [Dep. of Poultry Sci. & Food Sci., Cornell Univ., Ithaca, New York 14853, USA]

The antagonism between lactic acid bacteria and spoilage and pathogenic bacteria was studied in ground and mechanically deboned poultry meat (MDPM). Resting cells of *Lactobacillus plantarum* (LAP, Lactacel DS), *Pediococcus cerevisiae* (PEC, Accel) or their 50:50 mixture were added to the meat. Addition of LAP or PEC at 10^8 cells/g to MDPM delayed time to spoilage at 3°C from 4 days to 5; LAP + PEC (2×10^8 /g) delayed time to spoilage from 4 days to 6. Use of 10^9 cells/g gave an additional day of shelf life for LAP or PEC or their mixture (2×10^9 /g). Shelf life of ground poultry meat at 3°C was increased from 8 days for control to 10 days for 10^9 LAP or PEC/g, and to 12 days for LAP + PEC mixture (2×10^9 /g). Meat pH did not change during the storage period. Fluorescent psychrotrophs were present in control but not treated meat samples. Results are presented for growth of LAP or PEC in association with other bacteria in buffered brain heart infusion (BHI) broth; PEC inhibited (i) *Pseudomonas fluorescens* and (ii) *Ps. putrefaciens* but not (iii) *Ps. fragi*, LAP repressed (i) and (iii) and impaired the colony forming ability of (ii) on standard methods agar. LAP totally repressed growth of (iv) *Salmonella typhimurium* in BHI, as did PEC; similar results were obtained for (v) *Staphylococcus aureus*. Growth of (i)-(v) on agar plates in the presence of LAP or PEC was studied by the 'spot on the lawn' technique; both LAP and PEC showed zones of inhibition for (v), but for (v) only. Reasons for difference of these results from those in association broth culture are discussed, as is the principle of using LAB, PEC or their mixture in poultry and other meat products. DIH

94

The treatment and costs of effluents from poultry and pig abattoirs.

Marson, H. W.; Pos, J.

Process Biochemistry 13 (10) 18-20, 24 (1978) [En] [Pielkenrood-Vinitex, Assendelft, Netherlands]

After consideration of the charges made by water authorities in the UK and the Netherlands for dealing with raw effluent from abattoirs and of means by which these charges could be reduced (e.g. full or partial treatment of the effluent at the abattoir), a process developed by Pielkenrood-Vinitex for treating abattoir effluent is described in detail with the aid of diagrams. Basically it involves: screening to remove feathers, skin, bone and offal fragments; pipe flocculation of the screened liquor with a ferric salt and polyelectrolyte; sludge flotation (achieved by mixing the flocculator discharge with a stream of air micro-bubbles to form flocs which rise to the surface and produce a sludge layer, any residual material being passed through a

plate pack); and sludge thickening, removal and drying. Additionally, a simple activated sludge process can be incorporated to further reduce the COD of the effluent, and also filtration (using sand or activated C) and sterilization (using chlorination or UV treatment) to yield pure water. The composition and possible uses (e.g. in chicken feed) of the recovered sludge are discussed. The costs of operating the effluent treatment system in the UK and Netherlands and the charges made by water authorities for dealing with treated and untreated effluent are also considered. JA

95

[Hygiene and sanitary improvement in processing of fresh poultry and pig meat.]

Balsano, R.

Industria Alimentari 17 (11) 851-854 (1978) [It] [Lab. di Chim. Ind., Bergamo, Italy]

Results of use of 0.15% San-Pel (preparation said to be free of disinfectants and noxious substances; no other information given) in scalding water at 51°C for poultry carcasses are tabulated. 20 000 carcasses were passed through a 6000-l. bath in a total time of 8 h. Total bacterial counts of 6 million/cm² skin before slaughter were reduced to 1400/cm² with absence of *Salmonellae* and coliforms after passage through the plucking machine, and storage time of the poultry was increased by 4-5 days. It is claimed that the constituents of San-Pel are non-toxic and innocuous at the concn. used, have no effects on tissues or organs or on normal post-mortem biochemical processes, and leave no residues on carcasses after rinsing. SKK

96

Fermented mechanically deboned poultry meat and survival of *Staphylococcus aureus*.

Raccach, M.; Baker, R. C.

Journal of Food Protection 42 (3) 214-217 (1979) [16 ref. En] [Dep. of Poultry Sci., Cornell Univ., Ithaca, New York 14853, USA]

Mechanically deboned poultry meat (MDPM) was used to formulate a fermented sausage product prepared by a natural lactic acid fermentation (fermentation by indigenous lactic acid bacteria). Salted MDPM (3% NaCl) stored at 5°C promoted growth of lactobacilli to a level of 10⁶ cells/g after 12 days. During the same period the population of indigenous *Staphylococcus aureus* decreased to below a detectable level but no change was observed in the population of added *S. aureus* (10⁷ cells/g). The MDPM attained pH 4.7 after 60 h of fermentation with corresponding developed acidity of 1.6% expressed as lactic acid. Heat treatment given to the sausage (to attain internal temp. of 60°C) brought about a reduction in population of both lactobacilli and *S. aureus* (4.1 and 5.6 log cycles, resp.); the latter decreased to an undetectable level. Acid, NaCl and NaNO₂ in combination with heat treatment (60°C, 60 min) gave the largest reduction of population of *S. aureus* resulting with a D-value of 23.6 min. Succinic acid in combination with either heat treatment (60°C, 60 min) or low temp. storage (7°C, 7 days) was the most effective treatment against *S. aureus*. Other acids active against *S. aureus* in decreasing order of effectiveness were lactic, acetic and citric. AS

97

A method of drawing the gizzard and crop from slaughtered poultry.

Denmark, Forsøgsfjerkraeslagteriet
British Patent 1 507 002 (1978) [En]

98

Method and apparatus for opening the body cavity of poultry.

Scheier, D. J.; Frederick, H. E. (Gordon Johnson Co.)
United States Patent 4 136 421 (1979) [En]

Apparatus is described for making a slit between a hole at the vent of a bird and its keel bone so as to provide an enlarged opening to the body cavity to permit the entry of an eviscerating tool. IFT

99

Device and method for making a cut in the anal region of a bird.

Verbakel, G. F. W. (Stork Brabant BV)

United States Patent 4 131 973 (1979) [En]

The device is comprised of a 1st member with a stop for the back of the bird and a lower 2nd member comprising a stop for the breast of the bird. At least one of these members can embrace the bird in a horizontal plane. A third member has a stop which delimits the movement of the bird moved upwards in a vertical direction. SP

100

Amino acid composition of some Egyptian poultry muscles.

Youssef, A. M.; El-Nakkadi, A. M. N.; Aboul-Enein, A. M.

Pakistan Journal of Science 27 (1/6) 37-44 (1975) [18 ref. En] [Biochem. Dep., Fac. of Agric., Cairo Univ., Cairo, Egypt]

Data are given for the amino acid compositions of muscle protein from breast and leg muscle of White Bialady, Fayumy and Rhode Island Red chickens, local and Pecken ducks, local geese and Egyptian turkeys. Free amino acid contents of muscles of poultry of these breeds are also given. Free amino acids comprised 0.7-1.0% of total amino acids. Differences between the poultry spp. and breeds studied are briefly considered. AJDW

101

[Relationships between some morphological and fattening characteristics of geese.]

Bulla, J.; Stasko, J.; Grom, A.; Dobalova, M.

Zivocisna Vyroba 23 (8) 597-603 (1978) [5 ref. Sk. ru. en, de] [Vyskumny Ustav Zivocisnej Vyroby, 949 92 Nitra, Czechoslovakia]

Data on some body dimensions, live wt. and liver wt. are tabulated for groups of 20 IV-1, Landrace and Masseub geese force-fed to 84 days of age. SKK

102

[Effect of breed and method and duration of rearing on slaughter value of Guinea fowl.]

Misikova, E.; Kociova, E.; Chrappa, V.

Zivocisna Vyroba 23 (9) 703-712 (1978) [26 ref. Sk, ru, en, de] [Vyzkumny Ustav Chovu a Sl'achtenia Hydiny, 900 28 Ivanka pri Dunaji, Czechoslovakia]

Groups of Ivanka, French and Nitra var. of Guinea fowl were reared on deep litter or in cages to 12, 14 or 16 wk of age. Results of slaughter evaluation, data on breast muscle area and breast dimensions, pH, colour and consistency of breast and thigh muscles; and results of organoleptic assessment of aroma, taste, juiciness and tenderness of cooked meat are tabulated for groups of 10 birds of each experimental variant. French var. Guinea fowl showed at 14 and 16 wk of age the best slaughter yields and at all ages the best proportions of meat in live wt. In the overall comparison of the 3 var., the French var. is considered best, and they are recommended for meat production by rearing on deep litter to 12 or, at most, 14 wk of age. SKK

103

The control of spoilage and pathogenic microorganisms in poultry meat by lactic acid bacteria.

Raccach, M.

Dissertation Abstracts International, B 38 (11) 5263-5264: Order no. 78-06344, 200pp. (1978) [En] [Cornell Univ., Ithaca, New York 14850, USA]

Studies on the potential for use of lactic acid bacteria (*Lactobacillus plantarum* and/or *Pediococcus cerevisiae*) for improvement of the shelf-life of refrigerated mechanically deboned poultry meat (MPDM) are described: effects of lactic acid bacteria on growth of *Pseudomonas fluorescens*, *Ps. fragi*, *Ps. putrefaciens*, *Salmonella typhimurium* and *Staphylococcus aureus* in Buffered Brain Heart Infusion broth, liquid pasteurized whole egg and cooked MPDM were investigated. Addition of lactic acid bacteria at 10^9 /g was more efficient than addition at 10^8 /g in prolonging the shelf-life of MPDM; a 50:50 mixture of *L. plantarum* and *P. cerevisiae* was more effective than either species alone. Addition of lactic acid bacteria prolonged shelf-life at 3° or 11°C by 1-2 days, and gave lower TBA values in stored samples. Psychrotrophic count of MPDM was reduced by a factor of 10 by addition of lactic acid bacteria. Inhibiting effects of the 2 lactic acid bacteria and their 50:50 mixture on the individual spp. of pathogenic and spoilage bacteria studied are discussed in detail. AJDW

104

Method for antibiotic determination in animal tissue, as applied to lasalocid. [Lecture]

MacDonald, A.

Journal of the Association of Official Analytical Chemists 61 (5) 1214-1221 (1978) [17 ref. En] [Hoffmann-La Roche Inc., Anim. Health Res., Nutley, New Jersey 07110, USA]

The development of a tissue residue method for an antibiotic is dependent on the history of the overall problem, the current requirements that must be met for regulatory approval, the chemistry of the compound, its physical/chemical parameters, and its microbiological spectrum for the best possible fit of all of these to ensure a procedure that will work reliably in the originator's laboratory and to the same degree of

effectiveness in any other laboratory. A note is made of those factors that must be included as controls on the procedure and those experiments that must be included to differentiate matrix from method influences. The specific case of lasalocid, used as a coccidiostat in poultry production, is considered. [See FSTA (1979) 11 4C194.] AS

105

[Profitability of using up-to-date techniques and technology in bone processing.]

Kaz'min, Yu. P.; Kalinina, T. N.; Osval'd, D. F.; Faivishevskii, M. L.; Dardik, V. B.

Myasnaya Industriya SSSR No. 12, 9-10 (1978) [Ru] [Tul'skii Myasoptitsekombinat, USSR]

Test results with the application of new technology for a bones processing complex using continuous processing equipment (KPK-250) at the Tula meat and poultry processing plant are discussed. The process is continuous without losses of raw material, the finished product reaches a high quality, the processing losses are reduced to a min. and labour safety is ensured. The equipment and its operation are described in detail. The bone meal obtained may be used directly or may be mixed with other products for feeding purposes. An economic evaluation is presented. The throughput of the equipment is 250 kg bones/h or 1040 t/yr. The actual fat yield after 7 months during the yr 1978 amounted to 13.3%. Exploitation of the equipment resulted in considerable economy. STI

106

Concurrent determination of residues of the coccidiostats 2-chloro-4-nitrobenzamide (aklomid) and 3,5-dinitro-o-toluamide (zoalene) in poultry meat.

Winchester, R. V.

New Zealand Journal of Science 21 (4) 553-555 (1978) [9 ref. En] [Chem. Div., Dep. of Sci. & Ind. Res., Petone, New Zealand]

A method is described for the gas chromatographic detn. of residues of 2-chloro-4-nitrobenzamide (aklomid) in poultry meat. A recovery rate of $85 \pm 4\%$ was obtained for samples fortified with aklomid in the range 0.05 to 0.40 mg/kg. Residues of aklomid were found in 2 experimental chickens to which the drug had been fed without a withdrawal period but not in 3 chickens purchased commercially. The method is also suitable for the detn. of 3,5-dinitro-o-toluamide (zoalene) residues, either alone or concurrently with aklomid. AS

107

The intestinal microflora of poultry and game birds during life and after storage. [Lecture]

Barnes, E. M.

Journal of Applied Bacteriology 46 (3) 407-419 (1979) [59 ref. En]

This review of poultry intestinal microflora includes a description of the role of microflora in the stored uneviscerated carcass. Rates of spoilage of chickens and turkeys, and influence of diet on length of time that game birds may be hung without spoilage are discussed. DIH

108

[Quality of goose meat.]

Wodziak, K.

Drobiarstwo 26 (10) 9-10 (1978) [Pl]

Comparative studies on the physicochemical characteristics of meat from 8- and from 26-wk old geese of the Zator breed are described including the chemical composition and calorie content of breast and thigh meat. Meat from the younger geese is more tender, has lower DM, fat and calorie contents and is more suitable for processing than that from the older geese. STI

109

[Combined method for roasting meat products.]

Belyaev, M. I.

Izvestiya Vysshikh Uchebnykh Zavedenii, Pishchevaya Tekhnologiya No. 6, 50-53 (1978) [6 ref. Ru] [Khar'kovskii Inst. Obshchestvennogo Pitaniya, Khar'kov, USSR]

The combined method of roasting meat and poultry comprises microwave heating, marinating, and traditional roasting. The method favourably influences quality of the final product, increases yield, and reduces thermal processing time. The stability of the amino acid composition of meat proteins is improved, whereby the biological value is enhanced, and protein losses during storage and transport of partially-processed products are reduced. STI

110

Profiles in poultry.

Anon.

Food Product Development 12 (8) 54, 57-59 (1978) [En]

The functional properties and applications of soy protein isolates are discussed. Their use in augmented poultry products is examined. Sample formulations are presented for 4 augmented poultry products: turkey breast, cooked turkey salami, white chicken deli roll, and poultry frankfurters, which have been developed by Ralston Purina Co., St. Louis, USA. Cooked yields from the augmented poultry were quite high. A 93.5% yield was obtained in turkey salami, 98% in chicken roll, and 115% in turkey breast. The marketing outlook for augmented poultry products and consumer response to combination soy-meat products are briefly considered. It is concluded that soy protein isolates permit poultry manufacturers more flexibility in formulation without the risk of lowering product quality. VJG

111

[Quality of duck meat following various culinary treatments.]

Zhabolenko, V. P.; Khlebnikov, V. I.; Talanov, P. A.; Akulich, A. A.

Izvestiya Vysshikh Uchebnykh Zavedenii, Pishchevaya Tekhnologiya No. 6, 60-63 (1978) [13 ref. Ru] [Donetskii Inst. Sovetskoi Torgovli, Donetsk, USSR]

Changes in lipids of duck meat during conventional roasting or roasting by a microwave/IR process were studied. Hydrolytic changes in the lipids were evaluated by means of the SHL factor, a measure of the relative

concn. of free fatty acids, monoglycerides, diglycerides/triglycerides and phospholipids. The SHL factor of raw meat is double that of raw fatty tissue. Heating results in a considerable rise in the SHL factor of fatty tissue, but only a slight rise in that of muscle tissue. The SHL factor was not clearly influenced by roasting process used. STI

112

[Experiments in determining of extraneous water contents in slaughter poultry.] Untersuchungen zur Feststellung des Fremdwassergehaltes in Schlachtgeflügel.

Scholtyssek, S.; Ehninger, F.; Augstein, E.

Fleischwirtschaft 59 (1) 83-88, 91 (1979) [De, en] [Univ. Hohenheim, Postfach 106, 7000 Stuttgart 70, Federal Republic of Germany]

See preceding abstr.

113

[Effect of heat processing on content of amino acids in products made from poultry meat.]

Khlebnikov, V. I.; Karpeev, I. I.; Stefanova, I. L.; Shirnyuk, T. Ya.; Kovalenko, L. A.

Trudy, Vsesoyuznyi Nauchno-issledovatel'skii Institut Myasnoi Promyshlennosti 20, 32-39 (1976) [5 ref. Ru]

The most favourable methods for poultry meat processing were studied, including the effects of electro-physical heating methods compared with those of common cooking methods. Defrosted broilers of the 1st quality were used for the experiments. The following methods were used, high-frequency (433 MHz) heat, IR lamps, a combination of high frequency heat - a thermostat at 80-85°C - IR heat, cooking in water and electrical heat. A KIA-3B analyser was used for the detn. of amino acids. When high frequency heat and the combined heating method were used no reduction in amino acid content occurred, while the common heating method reduced the amino acid content by 2.82% and the content of essential amino acids by 1.15%. The content of free amino acids was reduced by 25% when high frequency heat was used and by 44.4% resp. when conventional cooking was used. STI

114

[Bacteriological production control in a Danish poultry slaughterhouse, 1973-1974.] Bakteriologische Überwachung der Produktion in einer dänischen Geflügelschlachtereie im Zeitraum von 1973 bis 1974.

Jacobsen, C.

Fleischwirtschaft 59 (5) 664, 666-667, 709 (1979) [De, en] [Danpo, 6580 Vamdrup, Denmark]

The methods and results of bacteriological inspection in a Danish poultry slaughterhouse are reported, i.e. sampling from offals, broiler portions and whole broilers; counting methods; and bacteriological control of chilling and drinking water, equipment, cleaning utensils. A continuous rise in total and coliform counts was observed between scalding and evisceration, attributed to the close contact of the animals with each other and with the machinery. Total counts and especially coliform counts were reduced by passage

through 2 spin chillers. Staphylococcal contamination was attributed to old lubricating oil on a plucking machine, and could be prevented by daily cleaning and disinfection. For the weekend, storage in ice immediately after leaving the spin chiller (3°C) was better than storage in tanks with circulating iced water (5°C). If no other cold storage method is available, water temp. should be reduced to 1°C by addition of ice. The growth of psychrophilic bacteria (occurring during storage in the spin chiller) at 3°–5°C without change of water is prevented by daily cleaning and disinfection. RM

115

Extension of poultry shelf-life by poly (hexamethylenebiguanide hydrochloride).

Islam, M. N.; Islam, N. B.

Journal of Food Protection 42 (5) 416–419 (1979)
[18 ref. En][Dep. of Food Sci. & Human Nutr., Univ. of Delaware, Newark, Delaware 19711, USA]

Immersion of freshly processed poultry carcasses in solutions of poly (hexamethylenebiguanide hydrochloride), PHMB, retarded bacterial growth and markedly improved the shelf-life during storage at 2°C. Birds treated with 200, 300 and 400 p.p.m. PHMB solutions had average shelf-lives of 22.9, 25.9, and 26.0 days, resp., compared to the 10.5 days of shelf-life for water-treated controls. Duncan's multiple range test revealed that the shelf-life differences among PHMB-treated birds were not statistically significant. AS

116

[Determination of content of metals in canned poultry meat products.]

Martynyuk, T. G.; Sevostyanova, N. I.

Trudy, Vsesoyuznyi Nauchno-issledovatel'skii Institut Myasnoi Promyshlennosti 20, 40–45 (1976)
[4 ref. Ru]

Methods for detn. of Pb, Cu and Sn recommended by COMECON were compared with standard Soviet methods (GOST) and other commonly used methods. Comparisons between 'wet' and thermal incineration of can contents showed that in practice the results for Cu and Pb were not influenced by the incineration method. For Sn the thermal method gave lower results. The sensitivity of methods recommended by the COMECON for detn. of Cu and Pb (0.2 mg/kg) was considerably better than that of the standard methods (5 and 10 mg/kg); for Sn the sensitivity of both methods was equal. The combination of 'wet' incineration and spectrophotometric detn. of metals permitted quicker analysis (by 5 to 6 h) in comparison with the standard methods. STI

117

Aspects of the microbial ecology of poultry processing and storage: a review. [Review]

McMeekin, T. A.; Thomas, C. J.

Food Technology in Australia 31 (1) 35–43 (1979)
[83 ref. En][Dep. of Agric. Sci., Univ. of Tasmania, GPO Box 252C, Hobart, Tasmania 7001, Australia]

Aspects of the topic reviewed are: microbial contamination of poultry during processing; methods of

assessment of contamination; development of microorganisms on the carcass during storage; and histological and microbiological relationships e.g. the nature of the bacterium-skin interaction. VJG

118

[Chemical composition and calorific value of carcasses of Zator breed 8-weeks-old gosling broilers and 26-weeks-old traditionally-fed geese.]

Pamula-Wodziak, K.

Medycyna Weterynaryjna 34 (5) 295–297 (1978)
[27 ref. Pl][Inst. Hodowli i Tech. Produkcji Zwierzece, AR, Krakow, Poland]

100 Zator breed goslings were reared for 3 wk on a starter ration, and were then divided into 5 groups and given in the 4th–8th wk 5 feed mixtures ranging in crude protein content from 13.6 to 20.9% and in metabolizable energy from 2600 to 2800 kcal/kg. At 8 wk, 3 male and 3 female goslings were slaughtered from each group; the remaining 70 were then fed on pasture during the summer, and for the final 2 wk in autumn were traditionally fattened on oats, and 3 males and 3 females from each group were slaughtered at 26 wk of age. Overall mean values with s.d. for carcass composition of groups of 15 female and male goslings and female and male geese were, resp.: moisture, 54.47 ± 4.29 and 53.42 ± 6.20 , and 44.49 ± 3.11 and 45.37 ± 2.63 %; protein, 17.73 ± 1.89 and 17.81 ± 1.10 , and 19.61 ± 1.14 and 20.59 ± 0.76 %; and fat, 24.17 ± 5.67 and 25.52 ± 3.37 , and 31.31 ± 3.45 and 28.86 ± 2.75 %. Differences in moisture and fat contents between goslings and geese were significant at $P < 0.01$; and those in protein contents were significant at $P < 0.05$. Effects of the different rations in the broiler period on carcass composition are described and discussed; the differences were less marked in geese than in goslings. [See also following abstr.] SKK

119

[Iodine values of subcutaneous and internal fats of gosling broilers and adult geese.]

Pamula-Wodziak, K.

Medycyna Weterynaryjna 34 (5) 297–298 (1978)
[11 ref. Pl][Inst. Hodowli i Tech. Produkcji Zwierzece, AR, Krakow, Poland]

Mean I values are tabulated for the broilers and geese in the different feed groups described in the preceding abstr. The overall mean values with s.e. were for the female and male goslings and female and male geese resp.: subcutaneous fat, 48.7 ± 3.2 and 45.1 ± 3.3 , and 68.1 ± 0.88 and 69.2 ± 1.1 ; and internal fat, 65.8 ± 2.0 and 66.0 ± 2.1 , and 73.1 ± 1.0 and 72.9 ± 0.80 . Differences between the differently fed broilers, and between the geese differently fed in the broiler period, are described and discussed. SKK

120

[Tests on use of chlorine and acetic acid for disinfection of poultry carcasses surface-contaminated with Salmonella typhimurium.]

Działoszynska, J.; Wojton, B.

Medycyna Weterynaryjna 34 (1) 41–43 (1978) [22 ref.

Pl, ru, en][Zaklad Higieny Produktow Zwierzecych, Inst. Weterynarii, Pulawy, Poland]

Poultry carcasses obtained from poultry factories were surface-contaminated with *S. typhimurium* by application to the breast region of 1 ml of a suspension of an 18-h culture of a freeze-dried strain from the Veterinary Institute's collection, containing 1000 microorganisms/ml. 15 min after contamination, the carcasses were disinfected for 15, 20, 25 or 30 min using aqueous solutions of NaOCl containing active Cl at 100, 200, 250 or 300 p.p.m., or acetic acid solutions at pH 3.0, 3.5 or 4.0. It is concluded from tabulated results of culturing swab specimens and of organoleptic assessment of raw and cooked carcasses that NaOCl solution containing active Cl at 300 p.p.m. gave satisfactory decontamination within 15 min without appreciably affecting organoleptic quality; but that acetic acid at pH 3.0–4.0 was of little value as a disinfectant. SKK

121

[Basic characteristics of poultry meat as compared with beef, pork and mutton.]

Bogojevic, M.

Tehnologija Mesa 20 (1) 19–21 (1979) [3 ref. Sh, en] [Jugoslovenski Inst. za Tehnologiju Mesa, Belgrade, Yugoslavia]

Comparative tables of data are given for the proximate composition bone content, amino acid composition, tryptophan/hydroxyproline ratio and calorific value of pork, mutton, beef, goose, duck, chicken and turkey meat. The high nutritive value of turkey meat, and of white poultry meat in general, is discussed. The high digestibility and low fat content of poultry meat make it suitable for consumption by convalescents and the elderly. The potential for full utilization of the technological properties of poultry meat in the meat processing industry is discussed, with special reference to modern deboning techniques. STI

122

The modification of duck carcass fatty acid composition by dietary manipulation.

Olver, M. D.; Plessis, L. M. du; Dennison, C.

Agroanimalia 11 (1) 5–8 (1979) [4 ref. En, af, fr] [Anim. & Dairy Sci. Res. Inst., Private Bag X2, Irene 1675, South Africa]

4 groups each of 12 ducks (3 wk of age at the start of the experiment) were used in a 4-wk feeding trial conducted to evaluate effects of 4 diets on carcass composition. Diets (i)–(iii) were based on corn meal, fish meal, blood meal, rice bran, and soybean oilcake, and differed in containing (i) 16.33% starch + 16.33% sucrose, (ii) 10.0% sunflower oil or (iii) 25.0% of a formaldehyde-treated sunflower/soybean/gelatin mixture. Diet (iv) comprised commercial duck developer pellets. The ducks were slaughtered at 7 wk of age. Tables of results are given for the fatty acid composition of dried duck meat, and the carcass compositions of the ducks. Mean values for (i), (ii), (iii) and (iv) resp. were: total polyunsaturated fatty acids 12.5, 42.0, 36.1 and 14.6%; total saturated fatty acids 28.4, 22.5, 24.7 and 31.8%; polyunsaturated/saturated

fatty acid ratio 0.44, 1.87, 1.46 and 0.46; moisture in carcass 54.2, 49.8, 56.1 and 54.5%; fat in carcass 26.8, 27.1, 21.5 and 25.2%; dressed fat 677, 756, 485 and 605 g; polyunsaturated fat in dressed duck 85, 318, 175 and 88 g; and saturated fat in dressed duck 192, 170, 120 and 192. Oven-drying was not an acceptable alternative to freeze-drying prior to fatty acid analysis. AJDW

123

Moisture, fat, protein and mineral content of mechanically deboned poultry meat.

Essary, E. O.

Journal of Food Science 44 (4) 1070–1073 (1979)

[13 ref. En] [Dep. of Food Sci. & Tech., Virginia

Polytechnic Inst. & State Univ., Blacksburg, Virginia 24061, USA]

Mechanically deboned poultry meat samples from chicken broiler and turkey parts were analysed for moisture, fat, protein and mineral content. Moisture for turkey samples averaged 68.5%, fat 15.7% and protein 15.2%. Moisture, fat and protein for broiler samples averaged 72.2%, 14.4% and 13.4%, resp. The minerals or elements detected in the largest amounts in p.p.m. in decreasing order in turkey meat samples were K, Ca, Na, Cl, Mg, Fe, Cu, Zn, Rb and Al. In broiler meat samples the elements detected in largest amounts in p.p.m. in decreasing order were K, Na, Ca, Cl, Mg, Fe, Zn, Cu, Rb, Al and Br. Other minerals were present in smaller amounts. There was a wide range in levels of the different elements in turkey and broiler meat samples. IFT

124

Method and apparatus for packaging poultry specimens.

Machinefabriek Markert BV

British Patent 1 523 798 (1978) [En]

Poultry packing method and apparatus moves birds on conveyors against funnel jaws to hold the legs close to the body for insertion into a bag held by retainers adjacent to the funnel. IFT

125

FDA surveys nutrient labeling use on packaged food products.

Anon.

Food Product Development 13 (1) 54–56 (1979) [En]

The FDA surveyed the use of nutrient labels on packaged food products. Food products were purchased directly from the shelves of grocery stores in 3 major markets: New York, Chicago and Los Angeles. Food industry segments sampled included packaged foods representative of the 50 major supermarket food groups that make up Packaged Processed Foods and account for just under 50% of total grocery store food sales. A special sample was taken of Processed Meat/Poultry and products containing meat/poultry as an ingredient. Samples of bread, fresh milk and ice cream products were also included. Tabulated data present: retail sales of major food categories in US supermarkets; 10 highest and lowest ranking product groups based on % of sales bearing nutrient labelling;

20 highest ranking product classes based on % of sales bearing nutrient labelling; and 20 product classes with potential for mandatory nutrient labelling. An analysis of the 20 product classes with the potential of being regulated for nutrient labelling, showed that approx. \$2 billion in food sales would be affected (1976 retail prices.) This is to be contrasted with the 60% (\$27 billion) of individual brand sales using nutrient labelling voluntarily. VJG

126

[Package for poultry, game or meat.]

Station Avicole de la Grange

French Patent Application 2 404 574 (1979) [Fr]

A one-piece package, which may be made of cardboard, is formed from a shaped strip which folds up to form a base and two sides, which meet at the top and bring together 2 flaps which are then sealed to each other. The sides have openings to display the contents, e.g. wrapped pieces of chicken or game or joints of meat. The ends of the package are open. W&Co

127

Poultry processing.

Stork Brabant BV

British Patent 1 537 571 (1979) [En]

Apparatus is described for cutting through the neck arteries of slaughtered fowl which employs rotary knife guides which accurately position the birds on the conveyor. IFT

128

Poultry scalding.

Dew, D. R. L.

UK Patent Application 2 000 013A (1979) [En]

Poultry scalding apparatus is described in which negatively charged carcasses are sprayed with positively charged hot water sprays to improve heat transfer with reduced water consumption. IFT

129

Improvements relating to gripping devices for gripping feathers or the like.

Taylor, J.

British Patent 1 524 031 (1978) [En]

Rubber gripping finger apparatus for poultry plucking machine has longitudinally corrugated circumferential ribs to provide better gripping. IFT

130

[Method for treating slaughtered cattle and poultry.]

Machinefabriek G. J. Nijhuis BV

Netherlands Patent Application 7 704 267 (1978) [NI]

Method for cleaning slaughtered cattle and poultry carcasses by IR irradiation kills most bacteria present and checks invasion by new ones, giving a largely germ-free environment and so better keeping properties. W&Co

131

[Regulations and requirements for disinfection and pest control in the production and processing of poultry meat.]

Bulgaria, D'rzhaven Komitet za Standartizatsiya
Bulgarian Standard BDS 14594-78, 11pp. (1978) [Bg]

132

Health laws and regulations - European Communities.

World Health Organization

International Digest of Health Legislation 29 (1) 68-71 (1978) [En] [Geneva, Switzerland]

A selection of European Communities health laws and regulations is presented including the following which relate to food hygiene: Council Directive No. 78/50/EEC of 13 Dec. 1977 supplementing, as regards the chilling process, Directive No. 71/118/EEC on health problems affecting trade in poultry meat; Council Directive No. 78/142/EEC of 30 Jan. 1978 on the approximation of the laws of the Member States relating to materials and articles which contain vinyl chloride monomer and are intended to come into contact with foodstuffs; Council Directive No. 78/144/EEC of 30 Jan. 1978 amending for the sixth time the Council Directive of 23 Oct. 1962 on the approximation of the laws of the Member States concerning the colouring matters authorized for use in foodstuffs intended for human consumption; and Council Directive No. 78/145/EEC of 30 Jan. 1978 amending for the 13th time Directive No. 64/54/EEC on the approximation of the laws of the Member States concerning the preservatives authorized for use in foodstuffs intended for human consumption, empowers Member States to authorize the use of liquid smoke solutions (for the treatment of certain foodstuffs) until 31 Dec. 1980. VJG

133

Health laws and regulations - Greece.

World Health Organization

International Digest of Health Legislation 29 (2) 369-386 (1978) [En] [Geneva, Switzerland]

A selection of Greek health laws and regulations is presented including the following which relate to food hygiene: Presidential Decree No. 411 of 3 June 1976 on the veterinary inspection of poultry and poultry meat and its sanitary handling; Presidential Decree No. 490 of 5 July 1976 which lays down rules and conditions for the issuance of licences for the establishment and operation of poultry slaughterhouses; Presidential Decree No. 40 of 11 Jan. 1977 on the veterinary inspection of slaughterhouses and products of animal origin; Presidential Decree No. 653 of 7 July 1977 which prescribes rules for the importation, storage and movement of the deep-frozen meat of ruminants pigs, poultry, game and rabbits, and edible by-products of slaughtered animals; and Law No. 396 of 26 July 1976 on wine-making and trade in wine, which contains a list of substances which may not be present, or which may not be present in excess of the prescribed levels, in wine offered for human consumption. These include: Cl, Br, F, As, Mo, B and Hg. VJG

CHICKENS

1

Quantitation of polychlorinated biphenyl residues by electron capture gas-liquid chromatography: reference material characterization and preliminary study.

Sawyer, L. D.

Journal of the Association of Official Analytical Chemists 61 (2) 272-281 (1978) [9 ref. En] [FDA, 240 Hennepin Avenue, Minneapolis, Minnesota 55401, USA]

Wt. % compositions of individual peaks of Aroclors 1016, 1242, 1248, 1254 and 1260 were determined under standard GLC conditions. The GLC peak compositions were determined by using a Hall electrolytic conductivity detector for chlorine measurement and chemical ionization MS with single ion monitoring for mol. wt. characterization. The Aroclors used are available as reference materials for individual peak quantitation of polychlorinated biphenyl (PCB) residues by electron capture GLC. On the basis of a limited interlaboratory study and a collaborative study, using milk and chicken fat, the individual peak method shows improved interlaboratory precision and/or accuracy in PCB quantitation over existing methods. AS

2

Quantitation of polychlorinated biphenyl residues by electron capture gas-liquid chromatography: collaborative study.

Sawyer, L. D.

Journal of the Association of Official Analytical Chemists 61 (2) 282-291 (1978) [9 ref. En] [FDA, 240 Hennepin Avenue, Minneapolis, Minnesota 55401, USA]

10 collaborators quantitated 2 synthetically prepared polychlorinated biphenyl (PCB) mixtures, 2 PCB-fortified milk samples, and an incurred PCB residue in milk and chicken fat. 3 electron capture GLC methods were used for quantitating each unknown PCB against Aroclor reference materials. 2 of the methods were existing AOAC total response comparisons and the third was a proposed individual peak comparison. In addition, existing AOAC multiresidue pesticide methodology was employed for determining PCB recovery from whole milk. The average combined recovery of Aroclor 1254 from milk fortified at 1.4 and 2.7 p.p.m. (fat) was approx. 85% (coeff. of variation, 15%) with no significant difference by the methods of quantitation. The incurred PCB residue in milk (as 1254) was determined to be 1.3 (30%), 1.7 (31%), and 1.2 p.p.m. (18%) by total peak height, total area, and individual peak quantitation methods, resp. In the same order, incurred PCB in chicken fat was determined to be 6.8 (13%), 7.5 (16%), and 5.6 p.p.m. (8%) as 1242, or 6.9 (6%), 5.9 (8%), and 6.3 p.p.m. (8%) as 1248. Total PCB quantitated individually in a 3- and a 4-component chlorobiphenyl mixture, using 1248 as the reference standard, resulted in the following averages of actual amounts present: 3-component - 109% (23%), 95% (18%), and 95% (6%); 4-component - 116% (16%), 112% (29%), and 104% (7%), resp., for total peak

height, total area, and individual peak quantitation methods. Both the individual peak quantitation method and the AOAC multi-pesticide methodology have been adopted as official first action methods for PCB. AS

3

Distribution of injected ^{14}C -diethylstilbestrol in the chicken and laying hen. Whole body autoradiography and impulse counting.

Bengtsson, S. G.

Acta Veterinaria Scandinavica 19 (2) 254-262 (1978) [12 ref. En, sv] [Dep. of Anim. Hygiene, Coll. of Vet. Med., Swedish Univ. of Agric. Sci., Uppsala, Sweden]

8 two-wk old white leghorn chickens weighing about 130 g and 8-10 month old laying hens, live wt. about 1.5 kg, were fed a non-oestrogenic Swedish commercial feed mixture. Chickens and hens were given 40 μCi [monoethyl- ^{14}C]diethylstilbestrol (DES)/kg body wt., often used as a feed additive in chicken production, by an injection in each thigh muscle. Radioactivity in tissues of chickens and laying hens, sacrificed 4 h after intramuscular injection of DES, was measured. Results of measurements show the following values ($10^{-3} \times$ counts/min g^{-1} wet wt.) for chickens and hens, resp.: liver, 162-170 and 103-138; body muscle, 6.3-8.2, and 2.4-2.9; gizzard, 3.0-3.6 and 5.4-5.9; and for eggs from the hens, yolk membrane 11.9-12.7; albumen, 0.2; and yolk, 0.01. It was concluded that consumer products based mainly on the liver from DES implanted or DES fed chickens should be avoided unless it has been shown that no active DES or DES-residuals occur in this organ. SP

4

Accumulation and depletion of some organochlorine pesticides in high-producing laying hens.

Kan, C. A.; Jonker-den Rooyen, J. C.

Journal of Agricultural and Food Chemistry 26 (4) 935-940 (1978) [24 ref. En] [Spelderholt Inst. for Poultry Res., Min. of Agric. & Fisheries, 7361 DA Beekbergen, Netherlands]

Addition of low concn. of organochlorine pesticides to the feed of high-producing laying hens for 16 wk had no influence on feed consumption, body wt., egg production, egg wt., and deformation of the egg. Accumulation ratios (concn. of the pesticide in the egg or fat to its concn. in feed) on fat basis were: hexachlorobenzene in egg 11, fat 13; α -hexachlorocyclohexane (α -HCH) in egg 2, fat 2; β -HCH in egg 13, fat 15; γ -HCH (lindane) in egg 2, fat 2; heptachlor(epoxide) in egg 5, fat 7; DDT (total in egg 10, fat 12; and dieldrin in egg 11, fat 14. $\leq 80\%$ of the pesticides ingested were excreted via eggs and faeces. Half-value times of depletion of residues (with uncontaminated feed for 12 wk) were 1.5-2 wk for α - and γ -HCH. The other pesticides have half-value times of about 6-8 wk. Correlations between concn. of pesticides in abdominal fat and in egg fat within hens are generally very high ($r > +0.9$). The same holds for correlations between concn. in abdominal fat and fat of the thigh muscle, breast muscle, liver, and egg. AS

5

Relation of Enterobacteriaceae counts to Salmonella contamination of market broilers.

Mercuri, A. J.; Cox, N. A.; Carson, M. O.; Tanner, D. A. *Journal of Food Protection* 41 (6) 427-428 (1978) [14 ref. En] [Anim. Products Res. Lab., USDA, Athens, Georgia 30604, USA]

The Enterobacteriaceae counts and the Salmonella status (positive or negative) of 20 individual birds in each of 12 groups of broiler carcasses were determined. The overall logarithmic mean Enterobacteriaceae count for the 240 carcasses was 2.7 with group means ranging from 1.8 to 3.6. 123 (51.2%) of the 240 carcasses were Salmonella-positive. The number of Salmonella-positive carcasses within groups ranged from 0 to 18. No relationship was found between Enterobacteriaceae counts and presence of Salmonella in broiler carcasses. AS

6

[Tryptophan content of the whole body and some organs of broilers, in dependence on dietary protein sources.] Tryptophangehalte der Ganzkörper und einiger Organe bei Broilern in Abhängigkeit von verschiedenen Futterproteinen.

Steinhart, H.; Kirchgessner, M.

Archiv für Geflügelkunde 42 (3) 88-93 (1978) [24 ref. De, en, fr, ru] [Inst. für Ernährungsphysiol., Tech. Univ. München, Freising-Weihenstephan, Federal Republic of Germany]

This paper includes data for the tryptophan contents of tissues of 16-day old Lohmann broilers fed diets based on the following protein or amino acid sources: (i) commercial broiler feed; (ii) soybean protein; (iii) H₂O₂-treated soybean protein; (iv) H₂O₂-treated casein; or (v) an amino acid mixture. Mean values for tryptophan contents for birds fed (i), (ii), (iii), (iv) or (v) resp., were (% in fat-free DM): whole body 0.53, 0.46, 0.48, 0.33 and 0.51; brain 0.49, 0.50, 0.50, 0.34 and 0.52; liver 0.77, 0.84, 0.72, 0.72 and 0.60; and thigh muscle 0.62, 0.46, 0.49, 0.32 and 0.38. AJDW

7

[The proportions of individual tissues in broiler carcasses, and the content of nutrients in broiler meat.] Gewebeanteile von Broiler-Schlachtierkörpern sowie Gehalt an Nährstoffen in Broilerfleisch.

Schön, L.; Ristic, M.

Archiv für Geflügelkunde 42 (3) 85-87 (1978) [8 ref. De, en, fr, ru] [Inst. für Fleischerzeugung, Oskar-von-Miller-Strasse 20, 6850 Kulmbach, Federal Republic of Germany]

Studies on the proportions of tissues in carcasses of 80 Lohmann broiler carcasses (average wt. 900 g) are described; tables of data are given for the proportions of meat, bones, fat, skin and tendons and the cutting losses of the breast, back, wings, leg and the whole carcass. Chemical composition of the meat was also evaluated. Tables of data are given showing effects of storage time (0-12 days), cooling medium (water vs. air) and scalding temp. (48-50° C or 56-58° C) on the moisture, ash, fat, protein and non-fat organic matter contents of the breast and thigh meat; and the contents

of total carbohydrates, hydroxyproline and tryptophan in the skin, fat, and lean meat of the breast and thigh cuts. A table of literature data for the concn. of Ca, Cu, K, Mg, Na, Rb, Fe and Zn in breast and thigh meat is also given. AJDW

8

Liquid nitrogen exposure as an alternative means of chilling poultry.

Arafa, A. S.; Chen, T. C.

Journal of Food Science 43 (3) 1036-1037 (1978) [22 ref. En] [MAFES, Poultry Sci. Dep., Mississippi State Univ., Mississippi 39762, USA]

Chilling of broilers by liquid N₂ exposure resulted in lower Warner-Bratzler shear values and longer sarcomere lengths, indicating more tender meat, when compared with immersion chilled broilers. Liquid N₂ chilling also resulted in higher cooking yields. Experienced panelists detected a highly significant (P < 0.005) difference between cooked liquid N₂ chilled and immersion chilled poultry meat, with a preference for the liquid N₂ chilled product. Significant correlations existed between objective and subjective methods for tenderness evaluation and between Warner-Bratzler shear values and sarcomere lengths. Liquid N₂ chilling of poultry resulted in a product with a longer shelf-life when compared with that of immersion chilled broilers. IFT

9

A comparative study of muscle nitrogen fractions of different species of animals.

Ramadas, P.; Misra, D. S.

Indian Journal of Animal Research 11 (2) 71-73 (1977) [8 ref. En] [Coll. of Vet. Sci., G.B. Pant Univ. of Agric. & Tech., Pantnagar 263145, India]

N fractions were studied in fresh semitendinosus muscle of (i) goats, (ii) sheep, (iii) buffaloes, (iv) cattle and (v) pigs, and in fresh breast muscle of (vi) chickens. Muscle samples from 6 individuals of each species studied were tested. Mean values were, for (i)-(vi) resp. (% by wt.): total N 2.186, 3.243, 3.369, 3.440, 3.184 and 3.143; total soluble N 1.338, 1.141, 1.211, 1.408, 1.120 and 1.555; soluble non-protein N 0.380, 0.571, 0.368, 0.512, 0.427 and 0.693; sarcoplasmic N 0.959, 0.570, 0.843, 0.914, 0.680 and 0.862; myofibrillar N 0.731, 1.465, 1.596, 1.685, 1.508 and 1.140; and stromal N 0.691, 0.636, 0.564, 0.347, 0.567 and 0.369. AJDW

10

Effectiveness of sampling methods for Salmonella detection on processed broilers.

Cox, N. A.; Mercuri, A. J.; Tanner, D. A.; Carson, M. O.; Thomson, J. E.; Bailey, J. S.

Journal of Food Protection 41 (5) 341-343 (1978) [24 ref. En] [Anim. Products Lab., Richard B. Russell Agric. Res. Cent. USDA, Athens, Georgia 30604, USA]

A total of 240 processed broiler carcasses (water-chilled and unfrozen) were each sampled by 3 methods (whole-carcass rinse, neck-skin rinse, and macerated neck skin) for detection of Salmonella. In addition to this, various procedures were compared: destructive (incubating the entire carcass with the rinse fluid) versus non-destructive (incubating the rinse water

with conc. lactose or selenite cystine broth added after removal of the carcass) sampling and pre-enrichment versus no pre-enrichment during *Salmonella* detection procedures. There was no significant difference ($P < 0.05$) between % *Salmonella*-positive carcasses obtained by destructive sampling and the % obtained by non-destructive sampling of whole carcasses. There was also no significant difference ($P < 0.05$) in results obtained by rinsing and blending excised neck-skin samples. There was a highly significant difference ($P = 0.001$), however, between whole carcasses and neck-skin analyses. With whole-carcass sampling, 45% of the carcasses were positive for the presence of *Salmonella* while with rinsing or blending the neck skin of these same carcasses, only 11% and 12%, resp., were positive for the organism. Pre-enrichment of the whole carcass, of the whole-carcass rinse, or of the neck-skin samples did not result in significantly greater % positive results than did direct enrichment of these samples. AS

11

Effects of estrogen in White Leghorn cockerels.

Chand, D.; Georgie, G. C.

Indian Journal of Animal Research 11 (2) 91-94 (1977) [16 ref. En] [Dep. of Anim. Prod. Physiol., Haryana Agric. Univ., Hissar, India]

20 White Leghorn cockerels (initial age 16 wk) were used in a 4-wk study on effects of administration of diethylstilbestrol dipropionate (Vetoestrol) at a weekly dose of 5 mg/bird on performance and carcass quality. Half the birds were treated with Vetoestrol; the remainder served as untreated controls. The results show that Vetoestrol treatment increased wt. gain, plucked wt., eviscerated wt., ready-to-cook wt., muscle wt., liver wt. and heart wt., but did not significantly influence the plucked or eviscerated carcass expressed as % live wt., the bone/meat ratio, or the gizzard wt. AJDW

12

Lack of effect of dietary ascorbic acid on stability of carcass fat and meat of broilers.

Bartov, I.

British Poultry Science 18 (5) 553-555 (1977) [12 ref. En] [Div. of Poult. Sci., Agric. Res. Organization, Volcani Cent., Bet Dagan, Israel]

Inclusion of ascorbic acid or ascorbyl palmitate in a diet containing soybean oil (40 g/kg) and BHT (25 mg/kg) did not affect the stability of abdominal fat and meat of broilers. Under the same conditions, inclusion of α -tocopherol acetate or ethoxyquin significantly improved the stability of these tissues. AS

13

Dewinging broiler chicks fed commercial ration supplemented with DL-methionine.

Omar, E. M.

Libyan Journal of Agriculture 6 (2) 259-268 (1977) [12 ref. En] [Dep. of Anim. Production, Univ. of Alfateh, Tripoli, Libyan Arab Republic]

A total of 360 chicks was fed a commercial ration supplemented with 0, 0.2 or 0.4% methionine. Chicks were either (i) dewinged (artibrachium and manus

segments both clipped), (ii) partially dewinged (manus segment clipped) or (iii) intact. Dewinging significantly reduced live body wt. at 4 and 8 wk. Breast meat % was reduced by 8.5% in (i) and 6.1% in (ii) compared with (iii), while leg meat % was increased by 5.2 and 3.0% in (i) and (ii), resp. The ratio of breast:leg meats was significantly lower ($P < 0.05$) in (i) than (iii), with (ii) being intermediate. Addition of 0.2% methionine to the ration increased breast meat by 4.9% and reduced leg meat by 5.4% compared with the control. AL

14

Feeding insect-infested ration to broiler chicks.

Omar, E. M.

Libyan Journal of Agriculture 6 (2) 247-252 (1977) [8 ref. En] [Dep. of Anim. Production, Univ. of Alfateh, Tripoli, Libyan Arab Republic]

An insect-infested ration was fed to 150 broiler chicks from 1 to 10 wk of age. Addition of methionine (0.3 or 0.6%) and olive oil (3 or 6%), and also, from 6 wk, lysine (0.3 or 0.6%) to the ration significantly ($P < 0.05$) improved chick growth and feed conversion efficiency compared with control (unsupplemented) ration, but had no effect on the dressing % or boneless meat %. AL

15

[Temperatures and concentrations of deleterious gases in vehicles used for transport of live broilers.]

Temperatur- und Schadgasverlauf bei Broilerttransporten.

Ehinger, F.; Gschwindt, B.

Archiv für Geflügelkunde 42 (4) 139-144 (1978) [7 ref. De, en, fr, ru] [Lehrstuhl für Kleintierzucht, Univ. Hohenheim, Postfach 107, 7000 Stuttgart 70, Federal Republic of Germany]

Studies were conducted in summer and winter on the environment inside trucks used for transport of broilers, and effects on meat quality. The results show that, in both seasons, temp. difference between the truck interior and the external environment was 6-8° C when the vehicle was in motion, > 20° C when the vehicle was stationary. CO₂ concn. followed a similar pattern to temp., reaching a max. of approx. 0.35 p.p.m. The NH₃ concn. was within the range 1-3 p.p.m. Data are given showing effects of transport for ≤ 6 h on the cooking loss, tenderness (evaluated instrumentally), extraneous water uptake and water holding capacity of breast and thigh muscles. Correlation between these coeff. are also given. Tenderness of both breast and thigh meat increased with increasing transport time in the winter, but deteriorated with increasing transport time in the summer. Extraneous water uptake was significantly influenced by transport time only in the summer, transport for 4 h giving higher values than transport for 2 or 6 h. Loosely-bound water content was min. after transport for 4 h in both winter and summer. AJDW

16

[Studies on the dependence of fattening performance and carcass quality of broilers on breed and diet.]

Untersuchungen zur Mastleistung und Schlachtkörperzusammensetzung von Broilern in Abhängigkeit von Herkunft und

Futterzusammensetzung.

Neupert, B.; Hartfiel, W.

Archiv für Geflügelkunde 42 (4) 150–158 (1978) [8 ref. De, en, fr, ru] [Inst. für Tiernährung, Univ., Bonn, Federal Republic of Germany]

A series of studies on the effects of broiler strain (7 German and foreign var. being tested) and diet (protein/energy ratio, lipid sources, etc) on fattening performance of broilers is described. The potential for prediction of carcass composition on the basis of data for individual cuts is considered. Numerous tables of experimental data are given and discussed in detail. Conclusions include the following: carcass composition may be calculated with acceptable accuracy on the basis of data for the shank; concn. of individual constituents of the carcass were closely correlated (e.g. a correlation coeff. of -0.75 between fat and protein concn.); broiler strain significantly influenced fattening performance and carcass quality; increased fat content of the diet tended to increase carcass fatness; and, in isocaloric diets, increasing dietary protein level decreased carcass fatness. AJDW

17

[Maize or wheat in diets for fattening of broilers.]

Rous, J.

Sbornik Vysoke Skoly Zemedelske v Praze, Fakulta Agronomicka, B No. 1, 139–151 (1978) [10 ref. Cs, en, ru] [Katedra Chovu Prasat a Drubeze, Vysoka Skola Zemedelska, Prague-Suchdol, Czechoslovakia]

Groups of Ross broiler chicks were used in a feeding trial (over the age range 1 day–7 wk) to evaluate effects of diets based on wheat or maize (together with soybean meal alone or in combination with fish meal) on carcass quality. Tables of results are given, including data for slaughter yield, % skin, % internal fat, % breast meat and % thigh meat. No significant effects of diet on the carcass characteristics studied were observed.

[From En summ.] AJDW

18

[Effects of dried skim-milk as a dietary protein source on the meat quality of broilers.] Einflüsse von Magermilchpulver als Eiweisskomponente im Futter auf die Fleischbeschaffenheit von Broilern.

Ristic, M.; Vogt, H.

Archiv für Geflügelkunde 42 (4) 136–139 (1978) [7 ref. De, en, fr, ru] [Inst. für Fleischerzeugung, Bundesanstalt für Fleischforschung, Oskar-von-Miller-Strasse 20, 8650 Kulmbach, Federal Republic of Germany]

480 Lohmann B975 broiler chicks (slaughtered at 7 wk of age) were used in a study on effects of diets containing 0, 3, 6, 9 or 12% dried skim-milk on growth and meat quality. Tables of data are given for the quality of fresh carcasses of broilers fed diets with 0, 6 or 12% skim-milk powder, and carcasses of control broilers stored at -18°C for 3 months, and carcasses of control broilers scalded at 60°C , then stored at $+2^{\circ}\text{C}$ for 3 days. Values are given for slaughter wt., drip loss, and the grilling losses, pH, colour lightness, rigor value, water holding capacity, organoleptic properties and instrumentally measured tenderness of breast and thigh muscle samples. Effects of the dried skim-milk contents of the diet on meat quality were small; such slight

effects as were observed were attributable to the relatively high protein content of diets containing high dried skim-milk levels. AJDW

19

Some characteristics of the NAD(P)H-dependent lipid peroxidation system in the microsomal fraction of chicken breast muscle.

Player, T. J.; Hultin, H. O.

Journal of Food Biochemistry 1 (2) 153–171 (1977) [22 ref. En] [Dep. of Food Sci. & Nutr., Univ. of Massachusetts, Amherst, Massachusetts 01003, USA]

Incubation of the microsomal fraction isolated from chicken breast muscle in the presence of NADPH, ADP and Fe^{3+} ions was shown to result in lipid peroxidation. NADH was able to replace NADPH as the source of reducing equivalents but was less efficient. The pH optimum for malonaldehyde production was found to be around pH 6.7. O_2 uptake by the system was shown to have a pH optimum of 5.5. O_2 uptake was approx. linearly dependent on temp. but malonaldehyde production exhibited a sharp increase between 25°C and 37°C . The activity of the lipid peroxidation system was maintained after storage for 7 days at pH 7.25 and 4°C . At pH 5.6 a reduction in activity was noted after 7 days. AS

20

Recovery of salmonellae from broiler carcasses by direct enrichment.

Cox, N. A.; Mercuri, A. J.

Journal of Food Protection 41 (7) 521–524 (1978) [26 ref. En] [Anim. Products Lab., Richard B. Russell Agric. Res. Cent., USDA, Athens, Georgia 30604, USA]

Each of 4 serotypes of *Salmonella* (*S. anatum*, *S. montevideo*, *S. saint-paul*, *S. typhimurium*), inoculated at low levels on broiler carcasses (approx. 20 cells/carcass), was detected by direct enrichment of the whole carcass rinse fluid with either Selenite Cystine Broth (SC) or Selenite Brilliant Green Broth (SGB). Neither Selenite Brilliant Green Sulfa Broth (SBGS) nor TT Broth was effective in detecting the serotypes unless the entire broiler carcass with the rinse fluid was incubated with either of these enrichment broths. SGB and SC were effective as direct enrichment broths for recovering pure cultures of the 4 serotypes subjected to sublethal heat treatment (53°C for 1 min) approximating that to which broiler carcasses are subjected during the commercial scalding process. AS

21

Riboflavin and thiamine retention in frozen beef-soy patties and frozen fried chicken heated by methods used in food service operations.

Ang, C. Y. W.; Basillo, L. A.; Cato, B. A.; Livingston, G. E.

Journal of Food Science 43 (3) 1024–1025, 1027 (1978) [2 ref. En] [Food Sci. Ass., Inc., Dobbs Ferry, New York 10522, USA]

Frozen beef-soy patties, raw or char-broiled, and frozen fried, breaded chicken parts were heated by various methods, and vitamin B_1 and B_2 retentions were

determined. Heating methods used were: hot air convection followed by holding hot for 0, 1, 1.5, or 3 h and IR, high pressure steam, or microwaves followed by hot holding for 1 h. Riboflavin retentions in beef patties were >89%, except when IR heating was used (80%). Reheated chicken retained 87–93% of riboflavin, and there was no significant difference among treatments. Thiamin retention was lowest in chicken parts reheated by convection and held hot for 3 h (74%). IR heating resulted in 81–84% thiamin retention in beef or chicken while other methods retained 86–96%. Moisture, fat, riboflavin and thiamin contents of raw ingredients and cooked products are tabulated. IFT

22

[Changes in nucleic acid levels in livers of Cornish × White Rock crossbred chickens during growth.]

Jastrzebski, M.; Gajewska, M.; Pietras, M.
Roczniki Naukowe Zootechniki 5 (2) 27–34 (1978)
[19 ref. Pl, en, ru] [Zaklad Fizjologii Zwierzat Inst. Zootech., Aleksandrowice, Poland]

90 Cornish × White Rock chickens were used in a study on changes in nucleic acid concn. in the liver over the period 1 day–56 days of age. Tables of data are given for body wt., liver wt., liver wt. as % of live wt., % DM in the liver, and RNA and DNA concn. in the liver, and a graph is given showing changes in the RNA/DNA ratio in the liver. The results show that RNA content (DM basis) rose from an initial value of 20.51 mg/kg to a max. of 46.53 mg/kg at 2 wk of age, then decreased to approx. 30 mg/kg. DNA content (DM basis) rose from an initial value of 5.08 mg/kg to a max. of 11.38 mg/kg (at 2 wk of age), then decreased slightly to a level of approx. 11 mg/kg. DM content of the liver decreased from an initial value of 37.10% to fluctuate over the range 25.81–26.92% from 7 to 56 days of age. [See also FSTA (1977) 9 9S1730.] AJDW

23

[Residues of penicillin in meat and viscera of chickens.]

Enriquez, A. C.
Anales de la Facultad de Veterinaria de Leon 22 (2) 683–720 (1976) [14 ref. Es, en, fr] [Catedra de Bromatologia y Microbiol. de Los Alimentos, Fac. de Vet. de Leon, Univ., Oviedo, Spain]

Detailed accounts are given of studies on: residues of procaine penicillin G in tissues of chickens injected with therapeutic doses (5000–100 000 IU/kg live wt.) of this antibiotic; the stability of residues of procaine penicillin G in chicken muscle (with reference to effects of refrigeration at 4° C, freezing and frozen storage at –18° C, or heating at 60°, 80° or 100° C for 30, 60 or 90 min at pH over the range 5.3–7.1); and effects of muscle pH and lactic acid content on the formation of non-specific inhibition zones in examination for inhibitory substances, using *Sarcina lutea* as the test organism. Tables and graphs of results are given, and discussed in detail. The results show that residue concn. in the tissues are highest 2 h after injection, then decrease rapidly. Residues are higher in the liver and kidney than in the muscle; even with a dose of 100 000 IU/kg live wt., only traces were detectable in

muscle 24 h after treatment. Studies on the stability of residues in refrigerated samples showed that residues remain detectable throughout the storage period during which acceptable quality is maintained. Penicillin residues could be reduced by heating; however, high temp. (100° C) and prolonged heating were required to cause major decreases. Heat-stability was greatest over the pH range 5.9–6.5. Occurrence of false-positive inhibition zones did not appear to be due to pH, lactic acid concn. or residues of the extraction solvent (oxalate/EDTA/acetone). AJDW

24

Commercial aspects of broiler production and marketing.

Abhijit Sen
Poultry Guide 15 (4) 61–65 (1978) [En]

25

Electrical stimulation of chickens. [Lecture]

Jensen, J. H.; Jul, M.; Zinck, O.
International Congress of Food Science & Technology - Abstracts p.124 (1978) [En] [Danish Res. Inst. for Poultry Processing, Hestehavevej 8, DK-3400 Hillerod, Denmark]

Carcasses of 270 chickens (40–42 days old at slaughter) were electrically stimulated at various voltages (50–800 V) at various frequencies (12.5, 16.8 or 25 Hz). Carcasses were stimulated for 60 s (polarity being changed after 30 s), either before or after scalding and plucking. Breast meat from stimulated and non-stimulated carcasses was examined organoleptically; no significant effects of stimulation on overall organoleptic quality, juiciness, or breast meat toughness were observed. [See FSTA (1979) 11 2A60.] AJDW

26

Innovations in sampling and culturing methods for bacteriological examination of broiler carcasses.

Thomson, J. E.; Bailey, J. S.
Journal of Food Science 43 (4) 1301–1302, 1306 (1978)
[20 ref. En] [Richard B. Russell Agric. Res. Cent., USDA, PO Box 5677, Athens, Georgia 30604, USA]

Broiler carcasses were sampled by excision of the neck skin with the aid of a special clamp, and by swabbing of the breast skin. Samples from both methods were compared for bacteriological evaluation of carcasses by standard plate counts and by 2 commercial miniature systems (Millipore and Easicult-TTC). In experiment 1, the excised neck skin method showed higher counts than the breast swab method on carcasses stored at 1.5° C for 7–18 days, but not on day of processing; counts did not differ significantly as a function of culturing and counting system (only standard plating and Millipore were compared) on carcasses stored 7–18 days, but were higher by standard plating than by Millipore on day of processing. In experiment 2, counts did not differ significantly as a function of the 2 sampling methods or 3 culturing methods, or between counts on 0 and 7 days of storage of carcasses at 1.5° C. The neck skin excise method combined with a miniaturized culturing system

was the fastest means to measure the general bacteriological condition of fresh or stored broiler carcasses. IFT

27

[Effects of diets based entirely on substances of plant origin on the performance and carcass quality of broilers.]

Koreleski, J.

Roczniki Naukowe Zootechniki, Monografie i Rozprawy No. 11, 75 pp. (1978) [209 ref. Pl, en, ru] [Zakład Żywnienia Zwierząt Inst. Zootech., Kraków, Poland]

22 experiments were conducted to evaluate the performance and carcass quality of broilers fed various diets based solely on ingredients of vegetable origin. Effects of various feed constituents (oilseed meals, field beans, dried sugar beet, cereals) and feed treatments (heating, alkali treatment, enzyme treatment) were studied, together with effects of amino acid supplementation of low-protein diets. Tables of results are given, including data for dressing %, the % breast meat, thigh meat and abdominal fat in the carcass, and gizzard wt. The results are discussed in detail, with reference to the relative merits of the various feeds studied. [From En summ.] AJDW

28

[Carcass composition and nutrient deposition of 3-5 week old broilers fed various energy and protein levels.] Körperzusammensetzung und Nährstoffansatz 3-5 Wochen alter Broiler bei unterschiedlicher Energie- und Eiweißversorgung.

Kirchgessner, M.; Roth-Maier, D. A.; Gerum, J. *Archiv für Geflügelkunde* 42 (2) 62-69 (1978) [13 ref. De, en, fr, ru] [Inst. für Ernährungsphysiol., Tech. Univ. München, 8050 Freising-Weihenstephan, Federal Republic of Germany]

45 male Lohmann hybrid broilers were used in a study on effects of the protein content of the diet (16, 21 or 26%), the energy content of the diet (2700, 3250 or 3750 kcal/kg and broiler age (3 vs. 5 wk) on body composition and nutrient deposition. Tables of results are given, including data for the TS, crude protein and crude fat concn. in the carcass. Fat and TS concn. in the carcass tended to increase with increasing energy concn. and decrease with increasing protein concn. in the diet; crude protein concn. in the carcass increased with increasing dietary protein concn. and decreased with increasing dietary energy concn. Age did not significantly influence the carcass composition of the broilers. Regression equations relating the energy/protein ratio of the diet to the composition of the carcass are also given. AJDW

29

Effects of ozone treatment on shelf life and microflora of poultry meat. [Lecture]

Yang, P. P. W.; Chen, T. C.

International Congress of Food Science & Technology - Abstracts p.262 (1978) [En] [Poultry Sci. Dep., Mississippi State Univ., Mississippi 39762, USA]

Weighed broiler pieces were soaked in ice water. Compressed air (control) or ozone (concn. 3.88 mg/l.) was dispersed through the pieces for 20 min at a flow rate of 2050 ml/min. The pieces were then drained and stored in polyethylene bags at 4-5° C for 28 days.

Ozone-treated samples had consistently lower microbial counts than controls throughout storage, and ozone treatment extended the shelf-life by 2.4 days. Ozone-treated samples contained 52.7% Gram-positive cocci and 12.7% Gram-negative rods; corresponding levels in controls were 39.6% and 22.4%. [See FSTA (1979) 11 2A60.] JA

30

[Effects of feed regime on the development of young poultry of meat breeds.]

Gondos, M.; Statov, C.; Turcu, D.; Rotunjanu, E.; Stavri, J.

Lucrarile Stiintifice ale Institutului de Cercetari pentru Nutritia Animalelor 6, 221-234 (1976) [11 ref. Ro, en, de, fr, ru]

A total of 720 broilers was used in a study, over the age range 0-21 wk, on effects of dietary protein, energy and essential amino acid levels, age and sex on performance and carcass quality. Tables of data are given for wt. of the liver, crop, gizzard, heart, kidneys, spleen, pancreas and abdominal fat, the DM, fat, protein, ash and cholesterol in the liver, and the DM, protein, N-free extract, fat and ash in the meat. The results are discussed in detail, with special reference to the relative importance of the effects of the variables studied. AJDW

31

[Protein requirements of broilers in relation to the fat content of the diet.]

Gondos, M.; Iliescu, V.; Turcu, D.; Rotunjanu, E.

Lucrarile Stiintifice ale Institutului de Cercetari pentru Nutritia Animalelor 6, 203-219 (1976) [12 ref. Ro, en, de, fr, ru]

320 Studler broilers were used in a feeding trial on effects of the protein and fat contents of the diet on performance and carcass quality. During the period 0-35 days of age, diets with 21 or 23% protein and 6-10.6% fat were studied; from 35 days up to 60 days of age, diets with 18-21% protein and 8.5-10.7% fat were studied. The broilers were slaughtered at 35 or 60 days of age. Tables of results are given including data for live wt.; wt. of the liver, gizzard, heart, spleen, pancreas and abdominal fat; the DM, fat and cholesterol content of the liver; and the DM, protein, fat, N-free extract and ash contents of the meat. The results are discussed in detail with reference to effects of sex, age and diet. AJDW

32

[Effects of high dietary fat levels and vitamin supplementation of the diet on accumulation of hepatic and abdominal fat in broilers.]

Gondos, M.; Turcu, D.; Rotunjanu, E.

Lucrarile Stiintifice ale Institutului de Cercetari pentru Nutritia Animalelor 6, 235-250 (1976) [12 ref. Ro, en, de, fr, ru]

Groups of Studler broilers were used in a study over the age range 0–85 days, conducted to evaluate effects of sex, slaughter age (35, 60 or 85 days), high dietary lipid concn. (10.7–13.5%, as sunflower oil) and supplementation with various combinations of α -tocopherol, vitamin B₁₂, choline, pyridoxine and calcium pantothenate on performance and carcass quality. Tables of results are given, including data for the wt. of liver, gizzard, heart, spleen, pancreas and abdominal fat, the DM, protein, fat, ash and cholesterol contents of the liver, and the DM, protein, N-free extract, fat and ash contents of the meat. The results are discussed in detail, with reference to the relative significance of the variables studied. In general, vitamin supplements reduced hepatic and abdominal fat accumulation. AJDW

33

[Effects of housing system on the performance of broilers.]

Sirbu, M.; Damian, C.; Murarasu, D.; Cimpoeru, V.; Turcu, D.

Lucrarile Stiintifice ale Institutului de Cercetari pentru Nutritia Animalelor 6, 251–263 (1976) [23 ref. Ro, en, de, fr, ru]

1048 Studler broilers were used in a study on effects of sex, housing system (deep litter or battery cages) and diet (23% protein and 3000 or 3200 kcal/kg over the age range 0–35 days, 21% protein and 3200 or 3400 kcal/kg over the age range 36–56 days) on performance and carcass quality. The broilers were slaughtered at 56 days of age. Tables of results are given, including data for slaughter yield; proportions of carcass parts (wings, neck, breast, leg, back); wt. of various organs (liver, gizzard, heart, spleen and pancreas); abdominal fat wt.; and the DM, protein, ash, N-free extract and fat contents of the meat. The significance of the variables studied is discussed. There was a tendency for battery-house broilers to have higher abdominal fat wt. and higher fat concn. in the meat than deep litter broilers. AJDW

34

[Effects of phosphorus intake on growth and development of chickens, in relation to levels of dietary protein and energy.]

Florescu, S.; Statov, C.; Paraschiv, S.; Stavri, J.; Florea, E. *Lucrarile Stiintifice ale Institutului de Cercetari pentru Nutritia Animalelor* 6, 191–201 (1976) [10 ref. Ro, en, de, fr, ru]

134 Leghorn chicks were used in a feeding trial over the age range 1–180 days, conducted to evaluate effects of the P content of the diet on performance and carcass quality. Diets with P concn. from 10% below normal to 30% above normal were studied. Tables of results are given for slaughter yield, the carcass wt., and wt. of head, liver, heart, spleen and gizzard. The results show that carcass wt. decreased with increasing dietary P level; the other characteristics studied were not significantly influenced by dietary P. AJDW

35

Identification of some new minor acids from chicken skin lipids.

Horvat, R. J.

Poultry Science 57 (3) 827–828 (1978) [8 ref. En] [Richard B. Russell Res. Cent., USDA, Athens, Georgia 30604, USA]

Lipids from the skin of commercially processed broilers were extracted by Folch's technique [Journal of Biological Chemistry (1957) 226, 497–509] and analysed for fatty acids as their methyl esters by GLC/MS. Of the 24 fatty acids identified, 5 had not been previously identified in either total chicken skin lipids or skin lipid fractions. They are: pentadecenoic acid (15:1), heptadecenoic acid (17:1), arachidic acid (20:0), heneicosanoic acid (21:0), and erucic acid (22:1). AS

36

Bacterial inhibitors formed during the adventitious growth of microorganisms in chicken liver and pig kidney.

Smither, R.

Journal of Applied Bacteriology 45 (2) 267–277 (1978) [17 ref. En] [Lab. of Gov. Chem., Dep. of Ind., Cornwall House, Stamford Street, London SE1 9NQ, UK]

Inhibitory activity (detected by *Bacillus cereus* var. *mycoides*), identical with that encountered in survey samples, was induced in homogenized fresh chicken liver or pig kidney samples by incubating at 30° C. The relative potency of each of 3 active components as detected by TLC/bio-autography of extracts of freeze-dried material was ascertained. 3 strains of *Streptococcus faecalis* and a *Lactobacillus* sp. were responsible for production of the inhibitory activity, which was not produced by any of these organisms in synthetic liquid media. It was concluded that the presence of inhibitory substances in 'fresh' meat may indicate a history of microbial activity at some stage between slaughter and testing and its detection may serve as a useful index of freshness. AS

37

The demand for broiler meat.

Huang, C.-L.; Raunika, R.

Poultry Science 57 (3) 588–592 (1978) [14 ref. En] [Dep. Agric. Econ., Univ. of Georgia Coll. of Agric. Expt. Sta., Georgia Station, Experiment, Georgia 30212, USA]

A cross-section analysis of broiler meat consumption in 22 major US cities during 1972–1975 was carried out. Variations in prices and other social and economic factors provided a basis for statistical analysis, to estimate and identify their effects on consumption patterns. HBr

38

A survey of the malonaldehyde content of retail meats and fish.

Siu, G. M.; Draper, H. H.

Journal of Food Science 43 (4) 1147–1149 (1978) [20 ref. En] [Dep. of Nutr., Coll. of Biol. Sci., Univ. of Guelph, Guelph, Ontario N1G 2W1, Canada]

A survey was made of the malonaldehyde (MA) content of 96 fresh and processed meat and fish samples obtained from supermarkets. MA content ranged from 0.14 µg/g in a cooked ham sample to 10.05 µg/g in a cooked chicken sample. 92% of the processed or cured meats and 38% of the fresh meats contained < 1 µg/g. 60% of the fresh meat samples ranged between 1 and 6 µg/g. Cooking led to only slight increases in MA in most meat samples, but up to 10-fold increases in roasts cooked for 3 h. IFT

39

Some factors influencing tenderness, flavor, and nutritive value of chickens.

Stadelman, W. J.

Food Technology 32 (5) 80-82 (1978) [10 ref. En] [Dep. of Anim. Sci., Purdue Univ., West Lafayette, Indiana 47907, USA]

Previous studies which determined the effect of processing factors on chicken tenderness, established methods for differentiating tough and tender meat and examined the effect of injections (e.g. fats, salt, flavourings, phosphates) on flavour and tenderness of poultry meat are first reviewed. A study is then reported which determined: % yield of parts (breast, legs, thigh, back, ribs, wings, neck, heart, gizzard, liver) from male and female frying and stewing chickens fed normal rations (data obtained by Swanson et al. [Agricultural Experimental Station Bulletin (1964) No. 476, University of Minnesota, St. Paul] are included in the tabulated results); % meat, skin and bone in these parts (frying chickens); and chemical composition (% moisture, fat, protein and ash) of these parts, both raw and cooked (breaded parts were browned in shallow oil for 8 min then placed in an oven preheated to 163° C and heated to an internal temp. of about 88° C in the thickest pieces). % moisture ranged from 76.7 (back) to 79.8 (gizzard) in raw parts and from 45.2 (heart) to 62.2 (wing) in cooked parts; corresponding figures for % fat were 0.7 (breast) to 7.1 (heart) and 4.0 (breast) to 17.1 (heart), for % protein 13.8 (heart) to 21.3 (breast) and 28.7 (neck) to 32.6 (breast and leg), and for % ash 0.58 (wing) to 1.02 (liver) and 0.82 (wing) to 1.94 (liver). Mention is also made of the possibility of changing the quantity and fatty acid composition of chicken lipids by modifying the lipid content of the diet. JA

40

The feeding value of fermented cassava peel in broiler diets.

Adeyanju, S. A.; Pido, P. P.

Nutrition Reports International 18 (1) 79-86 (1978) [13 ref. En] [Dep. of Anim. Sci., Univ. of Ife, Ile-Ife, Nigeria]

Fermented cassava peels were incorporated at (i) 0, (ii) 10, (iii) 20 and (iv) 30% levels into diets for broiler chicks which were fed for 9 wk. The effects of (i)-(iv) on carcass characteristics of the broilers were analysed. Results for (i)-(iv), resp. were: slaughter wt. (SW), 2.05, 1.69, 1.97 and 1.85 kg; dressing %, 71.25, 72.75, 71.96 and 69.80; gizzard, 2.10, 2.37, 2.12 and 2.13% of SW; liver, 2.02, 1.96, 2.17 and 2.36% of SW; heart, 0.47, 0.48, 0.45 and 0.47% of SW; and abdominal fat 1.72, 2.38, 1.55 and 2.07% of SW. It was concluded from the results that

20% fermented cassava peel is the optimum level for incorporation into broiler diets. SP

41

A study of bacteria contaminating refrigerated cooked chicken; their spoilage potential and possible origin.

Toule, G.; Murphy, O.

Journal of Hygiene 81 (2) 161-169 (1978) [10 ref. En] [Dep. of Microbiol., Univ. of Surrey, Guildford, UK]

Cooked chicken samples were divided into 3 portions: (i) allowed to spoil in a normal kitchen refrigerator (variable temp.); (ii) allowed to spoil at a standard 4° C and (iii) removed for biological examination immediately after cooking. After 10 days storage, bacteria were isolated from (i) and (ii). Counts of bacteria isolated from (iii) were low, 10^2 - 10^3 organisms/g. Flora isolated in high numbers from (i) included *Pseudomonas putida* (2.1×10^7 /g), *Ps. fluorescens* (6.7×10^7 /g), and *Aeromonas hydrophila* (2.8×10^7 /g). Flora isolated in high numbers from (ii) were *Ps. putida* (4.2×10^6 /g), *A. hydrophila* (6.0×10^6 /g) and *Corynebacterium* sp. (4.6×10^5 /g). Swabs taken from the kitchen isolated the following bacteria, *Ps. fluorescens*, *Flavobacterium* sp., *Bacillus* sp., *A. hydrophila*, *Proteus* sp., *Ps. putida*, *Arthrobacter* sp. and *Microbacterium thermosphactum*. When pure cultures of organisms isolated from spoiled chickens were inoculated into sterile cooked chickens and held at 4° C, the main spoilage organisms were *Ps. putida* and *A. hydrophila*, which were also isolated from the refrigerator where chickens were stored in the kitchen. *A. hydrophila* was found in significantly high numbers on plates, cutting knives, chopping boards and cold water taps. It was concluded that if *Aeromonas* and *Pseudomonas* could be eliminated from the environment, rapid spoilage of cooked chicken could be prevented, and its shelf life might be extended. SP

42

Single-pass centrifuge produces three different chicken by-products.

Anon.

Food Engineering International 3 (7) 43 (1978) [En, de, fr, es]

A chicken processor producing cooked chicken pieces from 87 000 chickens/day has installed a Westfalia De-Sludger/Separator (Model SA 45) to process the cooking broth. Approx. 2100 gal broth/h are separated into a heavy broth phase, clarified chicken oil, and meat and skin fragments. All by-products are of edible quality; the oil is sold to bakeries and producers of Kosher products, the broth is concentrated and used to replace gelatin as a binder in chicken products, and the meat and skin fragments are used as fillers in fabricated foods. DIH

43

[Flavour and odour changes in poultry and poultry products due to chlorophenols and chloroanisoles.] Dejocckheere, W.; Steurbaut, W.; Kips, R. H. *Revue de l'Agriculture* 31 (2) 289-294 (1978) [11 ref. Fr] [Univ. de l'Etat a Gand, Coupure Links 533 B-9000 Ghent, Belgium]

Literature data on flavour and odour defects in the meat, skin and eggs of chickens housed on litters of tetra- or penta-chlorophenol-treated wood shavings or straw (methylated to the corresponding anisoles by bacteria in the litter) are reviewed. An additional source of these compounds could be the animal carcass fat in the poultry feed. RM

44

Attempts to displace the indigenous antibiotic resistant gut flora of chicken by feeding sensitive strains of *Escherichia coli* prior to slaughter.

Linton, A. H.; Howe, K.; Richmond, M. H.; Clements, H. M.; Osborne, A. D.; Handley, B.

Journal of Applied Bacteriology 45 (2) 239-247 (1978) [17 ref. En] [Dep. of Bact., Univ. of Bristol, Bristol BS8 1TD, UK]

Attempts to limit the use of antibiotics have not, in general, resulted in the gut flora in farm animals becoming predominantly sensitive. Partial success was demonstrated, however, by feeding chickens with antibiotic sensitive *Escherichia coli* known to be good colonizers of the chicken gut. Where feeding was done prior to slaughter a corresponding reduction in carcass contamination by resistant *E. coli* was observed. Carcass contamination levels are presented in a table. AS

45

[Characteristics of staphylococci found on chicken carcasses.]

Wos, Z.; Jagodzinska, H.

Przemysł Spożywczy 32 (5) 186-187 (1978) [5 ref. Pl, ru, en, fr, de] [Centralny Ośrodek Badawczo-Rozwojowy Drobiarstwa, Poznań, Poland]

During 1974-1976, the skin and muscles of 78 broiler chickens were studied for types of staphylococci. A total of 128 cultures identifiable as *Staphylococcus* spp. was found. Of these, a substantial number (61) were coagulase-positive (*Staph. aureus*), producing haemolysin, phosphatase, fibrinolysin and lysozyme, particularly in the skin and when the muscles were bruised. HBr

46

Predicting protein efficiency ratio by the chemical determination of connective tissue content in meat.

Lee, Y. B.; Elliott, J. G.; Rickansrud, D. A.; Hagberg, E. C.

Journal of Food Science 43 (5) 1359-1362 (1978) [16 ref. En] [Campbell Inst. for Food Res., Campbell Place, Camden, New Jersey 08101, USA]

The influence of connective tissue content on amino acid composition and rat protein efficiency ratio (PER) was studied in an attempt to develop a regression equation for predicting PER of meat from the simple chemical analysis of collagen. Collagen content was highly correlated to essential amino acid content and rat PER, with correlation coeff. of -0.99 and -0.98 , resp. The developed regression equation, $PER = -0.02290(\text{collagen content}) + 3.1528$, effectively predicted rat PER within ± 0.2 units when tested on various meat ingredients. These results

indicated that the chemical detn. of collagen content can be employed to provide a rapid, inexpensive and easily adaptable assay for the estimation of protein quality of meat. Mechanically deboned red meat had a reasonably good PER (2.65) and only a moderate level of collagen (19%); whereas, partially defatted chopped beef showed wide variation in PER as well as in collagen content with different processors. Both raw and cooked mechanically deboned chicken also showed good PER, 3.0 and 2.6, resp. Proximate and amino acid analyses of the beef mixes studied are tabulated. IFT

47

[Effects of repeated thawing of body samples and of storage time of excrement on changes in N-metabolites.] Der Einfluss des mehrmaligen Auftauens von Körperproben sowie Lagerungszeit von Exkrementen auf die Veränderung von N-Metaboliten. Gruhn, K.; Jahreis, G.

Nahrung 22 (7) 619-629 (1978) [35 ref. De, en, ru] [Sektion Tierproduktion & Veterinärmed., Karl-Marx-Univ. Leipzig, Jena, German Democratic Republic]

Frozen samples of blood plasma and corpuscular blood constituents from 10 laying hens were thawed twice at intervals of 36 days (during which they were stored at -30°C) and analysed for changes in the trichloroacetic acid (TCA)-soluble proportion in the total N. Samples of muscle tissue, liver, and intestine were frozen in liquid N, stored at -30°C , thawed 3 times at 36 day intervals and also analysed for TCA-soluble N. In spite of the low storage temp., the TCA-soluble proportion in the blood fractions had significantly increased. Proteolysis could hardly be detected in muscle protein stored for 108 days and thawed 3 times. The liver and intestine samples showed significant increases of the TCA-soluble fraction after thawing, repeated freezing in liquid N and storage at -30°C . IN

48

Relationship of feed efficiency to carcass composition and metabolic rate in laying birds.

Morrison, W. D.; Leeson, S.

Poultry Science 57 (3) 735-739 (1978) [10 ref. En] [Dep. Anim. & Poultry Sci., Univ. of Guelph, Guelph, Ontario, Canada]

Laying hens maintaining a criterion of 13.5-15.5 kg eggs/48 wk and classified as 'efficient' or 'inefficient' with respect to feed conversion had comparable body wt. gains, and did not differ significantly ($P < 0.5$) in the protein or fat contents of their carcasses on slaughter after 12 months of production. HBr

49

Effect of temperature on shortening in chicken muscle.

Lee, Y. B.; Rickansrud, D. A.

Journal of Food Science 43 (5) 1613, 1615 (1978) [8 ref. En] [Campbell Inst. for Food Res., Campbell Place, Camden, New Jersey 08101, USA]

Chicken breast and thigh muscles were subjected to

different environmental temp. to determine if the phenomenon of cold shortening exists in chicken muscle. For both breast and thigh muscles, min. shortening was observed in the 4–10° C range. Muscles held at 0° C showed a slightly higher extent of shortening than at 4° C; whereas muscles held at > 20° C showed a severe shortening effect. It was concluded that no apparent cold shortening was detected in chicken muscle except at 0° C, and even at 0° C the extent of shortening was of a small magnitude compared to bovine muscles. Since high temp. induces a much greater shortening, muscle temp. must be lowered to < 20° C as early as possible to prevent excessive muscle shortening. IFT

50

[Studies on the microbiological-hygienic quality of slaughtered broilers, with special reference to *Staphylococcus aureus*.] Untersuchungen über die mikrobiologisch-hygienische Qualität von Schlachtbroilern unter besonderer Berücksichtigung von *Staphylococcus aureus*.

Fehlhaber, K.; Heim, D.

Monatshefte für Veterinärmedizin 33 (11) 411–414 (1978) [23 ref. De, en, ru] [Sektion Tierproduktion & Veterinärmed. Humboldt-Univ., Berlin]

The average count of aerobic bacteria in broiler muscle was found to be 4.6×10^4 /g; the count of *Staph. aureus* was $\leq 2 \times 10^2$ /g. 7 strains of *Staph. aureus* were isolated, and found to be enterotoxin-negative. Rearing method and changes in the skin did not appear to be closely related to the bacteriological characteristics of the muscle. It is concluded that broilers should be considered to be highly perishable; high standards of hygiene should be maintained during slaughter, transport, storage and processing of broilers. IN

51

[Storage life of chilled broilers in controlled atmospheres.] Zur Haltbarkeit von gekühlten Schlachthühnern in kontrollierten Gasatmosphären. Partmann, W.; Bomar, M. T.; Hajek, M.; Bohling, H.; Schlaszus, H.

Fleischwirtschaft 58 (5) 837–840, 843; 732 (1978) [7 ref. De, en] [Bundesforschungsanstalt für Ernährung, Engesserstrasse 20, 7500 Karlsruhe 1, Federal Republic of Germany]

Extension of the storage life on poultry at +1° C through controlled atm storage was investigated. 3 series of tests using 40 halves of broilers each were done, holding samples in air (0.03% CO₂) and at 20%, 100% and 50% (series 3 only) CO₂, with 80% and 50% N₂ resp., at +1° C and 0.8 bar excess pressure. Results of bacteriological, chemical and sensory tests shown graphically and in tables revealed increasing inhibition of the bacterial flora with rising CO₂ concn., with concomitant production in formation of free amino acids. Halves stored in air were spoiled after 2 wk, while in mixed atm samples were still satisfactory by all criteria. Broilers stored in pure CO₂ were of good quality throughout, once the blisters between skin and muscle caused by release of excess CO₂ pressure had disappeared (after 1 day in refrigerator at +4° C).

Mixed atm did not produce these blisters. After 4 wk storage in CO₂/N₂ atm broilers quickly deteriorated at refrigerator temp., but birds stored in 100% CO₂ remained 'satisfactory to good' for a further 5 days. RM

52

Direct instrumental measurement of skin color in broilers.

Yacowitz, H.; Davies, R. E.; Jones, M. L. *Poultry Science* 57 (2) 443–448 (1978) [6 ref. En] [Health Res. Inst., Fairleigh Dickinson Univ., Madison, New Jersey 07940, USA]

A special modification of the standard Hunter colour reflectance meter, designed for measurement of colour changes in human skin, was found to give excellent results for direct measurement of skin colour in broilers. It is rapid, and can be used on intact dressed broilers without prior removal of the skin. HBr

53

The influence of fasting and transport on yields of broilers.

Veerkamp, C. H.

Poultry Science 57 (3) 634–638 (1978) [7 ref. En] [Spelderholt Inst. Poultry Res., Min. Agric. Fish., Beekbergen, Netherlands]

Yields of the components of carcasses were measured on broilers fasted for different periods of time prior to slaughtering. The total wt. losses after 4 h of fasting are 0.353%/h. These losses are mainly caused by the losses of the edible parts, which are 0.24%/h. The results of measuring the losses of dry solids, water and fat of the edible parts without giblets are hard to interpret, due to the great variation in the chemical composition of the edible parts of individual broilers. AS

54

The influence of transportation on broilers.

Fris Jensen, J.

Poultry International 17 (3) 12, 14, 16 (1978) [En, de, it, es, fr 58] [Dep. of Poultry Sci., Copenhagen, Denmark]

Studies were conducted on effects of feed withdrawal before slaughter (≤ 20 h) and transport time (≤ 13 h) on the live wt., slaughter wt. and eviscerated wt. of broilers, and the differences between these wt. Tables of results are given; regression coeff. were calculated. The difference between live wt. and slaughter wt. tended to increase with increasing feed withdrawal period and transport time. Feed withdrawal for ≤ 16.5 h before slaughter decreased the difference between slaughter wt. and eviscerated wt.; longer withdrawal periods increased this wt. difference. Differences between slaughter wt. and eviscerated wt. increased with increasing duration of transport. Practical implications of these results are discussed. AJDW

55

Accumulation of organochlorine pesticides in poultry: a review. [Review]

Kan, C. A.

Journal of Agricultural and Food Chemistry 26 (5)

1051-1055 (1978) [52 ref. En] [Spelderholt Inst. for Poultry Res., Min. of Agric. & Fisheries, 7361 DA Beekbergen, Netherlands]

Accumulation ratios (level of pesticide in fat or egg to its level in the feed) of hexachlorobenzene (HCB), α -, β -, and γ -hexachlorocyclohexane (HCH), heptachlor and its epoxide, DDT, dieldrin, aldrin, endrin, and methoxychlor in eggs, laying hens and broilers are discussed. The pesticides can be grouped into several categories according to accumulation ratios: highly accumulating like HCB, β -HCH, heptachlor epoxide, dieldrin, aldrin; intermediate like heptachlor, endrin; low like α - and γ -HCH; and very low like methoxychlor. Depletion of residues of the pesticides in laying hens and eggs is correlated with the accumulative properties. Depletion of residues in broilers is mostly governed by growth rate and thus by dilution in the fat. AS

56

Distribution and metabolic fate of trans- and cis-permethrin in laying hens.

Gaughan, L. C.; Robinson, R. A.; Casida, J. E. *Journal of Agricultural and Food Chemistry* 26 (6) 1374-1380 (1978) [18 ref. En] [Pesticide Chem. & Toxicology Lab., Dep. of Entomological Sci., Univ. of California, Berkeley, California 94720, USA]

Radiocarbon from ^{14}C -carbonyl- and ^{14}C -methylene-labelled preparations of (IRS)-trans- and (IRS)-cis-permethrin, administered to laying hens for 3 consecutive days at 10 mg/kg for each dose, is largely eliminated from the body within 1 day after the last dose, a portion as $^{14}\text{CO}_2$. The excreta contain all and the eggs most of the following compounds identified by thin-layer cochromatography with authentic standards and specific enzymic hydrolysis: the unmetabolized pyrethroids; cis-permethrin hydroxylated at the 4'-position, at the methyl group trans to the carboxyl, and at both of these sites; the dichlorovinyl acids and their derivatives hydroxylated at the trans or cis methyl group; phenoxybenzyl alcohol, phenoxybenzoic acid and their 4'-hydroxy derivatives; and sulphate, glucuronide, taurine, and other conjugates of these alcohols and acids. Residues of unmetabolized trans- and cis-permethrin in fat are 0.15 and 0.93 p.p.m., resp., at 7 days after the last dose, and in eggs they reach peak levels of 0.3 and 1.2 p.p.m., resp., at 3-4 days after the last dose. AS

57

Increasing shelf life by carbon dioxide treatment and low temperature storage of bulk pack fresh chickens packaged in nylon/Surlyn film.

Sander, E. H.; Soo, H.-M. *Journal of Food Science* 43 (5) 1519-1523, 1527 (1978) [22 ref. En] [Dep. of Food Sci. & Nutr., Univ. of Minnesota, 1334 Eckles Avenue, St. Paul, Minnesota 55108, USA]

Simulated commercial bulk pack whole chickens were subjected to conventional ice pack or 3 modified atmospheric storage environments, vacuum and 2 levels of CO_2 within a nylon/Surlyn film. Pathogenic and nonpathogenic microbial growth, void space gas

composition (except ice pack) and off-odour development were monitored on samples stored at 1.1°C . Polynomial regression analysis of aerobic growth curves revealed that the lag phase was extended to 8 or 10 days. The transition from lag to log phase appeared when the residual level of CO_2 in the void space reached 15-55%. Following initial replacement of the air in the pouch with 95% CO_2 , the growth of anaerobic microorganisms was limited by the presence of CO_2 . The growth of potential pathogens, salmonella, coliforms, *Staphylococcus aureus* and *Clostridium perfringens* in the presence or absence of CO_2 was negligible at 1.1°C . Off-odour development can be detected when the colony forming units (CFU) numbers reach $10^6/\text{g}$ body wt. Carbon dioxide restricts the growth of most objectionable putrefactive off-odour bacteria; lactic acid organisms are encouraged by its presence on the surface of the sample and in the pouch void space. A recommended usage rate of $7.22 \times 10^{-4} \text{ m}^3 \text{ CO}_2/\text{kg}$ body wt. extends shelf life quality to 27 days at 1.1°C . IFT

58

[Battery rearing of broilers.]

Balint, I.

Revista de Cresterea Animalelor 28 (5) 28-35 (1978) [Ro] [Intreprinderea Avicola de Stat, Giarmata, Romania]

This paper includes comparative data for the carcass yield and grade of broilers reared in (i) battery cages and (ii) deep litter. Values for (i) and (ii) were, resp.: carcass yield 79.2 and 74.8%; % grade I carcasses 82.8 and 73.1; % grade II carcasses 12.7 and 20.9%; and % grade III carcasses 5.5 [4.5?] and 6.0. The incidence of carcass defects is also considered. AJDW

59

Meat anomalies in broilers.

Niewiarowicz, A.

Poultry International 17 (1) 50-51 (1978) [En, es, it, de, fr]

Studies on the occurrence of the PSE (pale soft exudative) and DFD (dark firm dry) defects in broiler meat are described. Aspects considered include: the relation of muscle pH to these defects; technological aspects of PSE and DFD broiler meat (covering emulsifying capacity, water holding capacity, thermal drip, colour, and susceptibility to microbial spoilage during cold storage); histological aspects; effects of age, season and the NH_3 concn. of the air in the broiler house on the incidence of the PSE and DFD defects; and the potential for use of tranquillizers for reduction of the incidence of PSE meat. AJDW

60

[Detection of radiation treatment for irradiated chicken on the basis of the radiation-induced loss of protein sulphhydryl groups.] Nachweis der Strahlenbehandlung bei bestrahltem Geflügelfleisch anhand des strahleninduzierten Verlustes von Proteinsulphhydrylgruppen.

Stockhausen, K.; Bögl, W.; Weise, H.-P.

Zeitschrift für Lebensmittel-Untersuchung und

-Forschung 167 (4) 256-261 (1978) [16 ref. De, en] [Inst. für Strahlenhygiene des Bundesgesundheitsamtes Berlin, Thielallee 88-92, D-1000 Berlin 33]

A spectrophotometric technique for the identification of irradiated chicken (*Gallus domesticus*) and estimation of doses ranging between 0.1 and 2.5 Mrad is described. Spectrophotometric detn. is made of the SH content in the animal tissue before (control) and after irradiation, by means of 6,6'-dithiodinicotinic acid. Ionizing radiation causes a permanent loss of SH groups in animal tissues such as from chicken. Irradiation at room temp. and storing at -18°C over a period of approx. 1 month does not show restitution or repair of the SH loss. The dose-effect relation for this radiation-induced decrease of the SH content can be described best by a double exponential function. Irradiation conditions, preparation of protein suspension from chicken, spectrophotometric investigations and other experimental details are reported. The results are all discussed in detail. AS

61

Army still plugging for FDA approval of irradiated meat.

Anon.

Science, USA 202 (4367) 500 (1978) [En]

The efforts of the USA Army to obtain FDA approval of irradiated meat are discussed, as well as claimed advantages of the system, and set-backs in contracts for long-term animal testing of irradiated beef, pork and ham. The army hope for FDA approval for chicken by 1983. AL

62

Improving quality of bird chiller water for recycling by diatomaceous earth filtration and chlorination.

Lillard, H. S.

Journal of Food Science 43 (5) 1528-1531 (1978) [8 ref. En] [USDA Sci. & Education Admin., Richard B. Russell Agric. Res. Cent., PO Box 5677, Athens, Georgia 30604, USA]

Bird chiller water was filtered in a vertical tank pressure leaf filter by use of 2 grades of diatomaceous earth (Diat). With both grades of Diat, significant reductions were obtained in suspended solids, dissolved matter, grease, COD, BOD and total Kjeldahl N, so that effective bactericidal treatment was accomplished with 26-28 p.p.m. Cl_2 gas. Total aerobic counts, faecal coliforms and salmonellae were essentially eliminated from filtered, chlorinated water. The pH of filtered chiller water was similar to the pH of the unfiltered water. Clarity and light transmission compared favourably with potable water. Filtered, chlorinated chiller water was neither aesthetically nor microbiologically objectionable. It was concluded that filtered chiller water could safely be reused to flume broiler giblets. [See also following abstr.] IFT

63

Evaluation of broiler necks flumed with diatomaceous earth filtered chiller water.

Lillard, H. S.

Journal of Food Science 43 (5) 1532-1534 (1978) [10 ref. En] [USDA Sci. & Education Admin., Richard B.

Russell Agric. Res. Cent., PO Box 5677, Athens, Georgia 30604, USA]

In order to conserve water and energy, the feasibility of fluming necks with treated bird chiller water instead of potable water was examined. No significant differences were found in shelf-life, total aerobic counts, levels of faecal coliforms, or salmonellae incidence between necks flumed with potable water and necks flumed with diatomaceous earth-filtered chiller water or filtered, chlorinated chiller water. It is concluded that the use of potable water is not essential in all phases of broiler processing and that necks could be flumed safely with either filtered chiller water or filtered, chlorinated chiller water. [See also preceding abstr.] IFT

64

Effect of level of structured protein fiber on quality of mechanically deboned chicken meat patties.

Lyon, C. E.; Lyon, B. G.; Townsend, W. E.; Wilson, R. L. *Journal of Food Science* 43 (5) 1524-1527 (1978) [14 ref. En] [USDA Sci. & Education Admin., Richard B. Russell Agric. Res. Cent., Athens, Georgia 30604, USA]

Mechanically deboned chicken meat (without skin) and chicken (with skin) were combined with 15 or 25% structured protein fibre (SPF) [a soy isolate] for subjective and objective evaluation of the quality of patties. Proximate composition, water-holding capacity, colour, texture, and cooking loss were objectively determined. Products were characterized by the Quantitative Descriptive Analysis sensory technique. Raw patties containing 15% SPF had a higher water-holding capacity than patties with 25% SPF. Cooked patties with 25% SPF required significantly more force to shear, exhibited higher cooking losses, and were characterized as more chewy and elastic, less moist, and more desirable than 15% SPF patties. Textural properties of patties containing mechanically deboned poultry meat were improved by adding 25% SPF; however, cook yield was greater for patties with 15% SPF. IFT

65

Temperature function integration and the development and metabolism of poultry spoilage bacteria.

Daud, H. B.; McMeekin, T. A.; Olley, J.

Applied and Environmental Microbiology 36 (5) 650-654 (1978) [8 ref. En] [Dep. of Agric. Sci., Univ. of Tasmania, Hobart, Tasmania 7001, Australia]

The rate of spoilage of chicken tissues, the development of spoilage bacteria, and the utilization of amino acids by spoilage bacteria as a function of temp. were more accurately described by the general spoilage curve of Olley & Ratkowsky [see FSTA (1973) 5 8B76 and 9R429] than by the linear equation of Spencer & Baines [Food Technolgy (Champaign) (1964) 18, 175]. Remaining shelf-life of poultry tissues may be predicted at temp. up to 16°C by using a temp. function integrator which incorporates the general spoilage curve. AS

66

[Possible production of Salmonella-free broilers.]

Notermans, S.; Oosterom, J.; Leusden, F. M. van; Shothorst, M. van

Tijdschrift voor Diergeneeskunde 103 (18) 948-955 (1978) [11 ref. Nl, en] [Rijksinst. voor de Volksgezondheid, Bilthoven, Netherlands]

The possibility of producing *Salmonella*-free broilers was studied. A number of measures would have to be introduced simultaneously, i.e. producing *Salmonella*-free day-old chicks, decontaminating feed and broiler houses, and preventing contamination from the environment. RM

67

Further studies on enrichment procedures for isolating *Salmonellae* from raw meat and poultry. Thomason, B. M.; Dodd, D. J.

Abstracts of the Annual Meeting of the American Society for Microbiology 78, 193 (1978) [En] [CDC, Atlanta, Georgia, USA]

Culture results obtained from samples of hamburger, pork sausage and chicken livers preenriched in lactose broth and buffered peptone water followed by selective enrichment in tetrathionate broth (TET) were compared with those obtained from samples placed directly into TET enrichment. 208 samples were studied. These were split into 3 aliquots; 1 was placed into each of the preenrichment broths, the other was put into TET broth. 40 samples were found positive. TET enrichment yielded 36 positive samples, whereas lactose broth and peptone water preenriched samples yielded 27 and 28 positive results, resp. Of the 36 samples found positive in TET broth, 12 were negative in the peptone-enriched aliquot. The 4 samples negative in TET were positive in the peptone water preenriched aliquot. The combination of preenrichment in buffer peptone water and direct enrichment in TET yielded the max. number (40) of positive samples. All samples positive in the lactose-preenrichment aliquot were also positive in the direct TET enrichment aliquot. These results support the authors' contention that lactose preenrichment should not be used for raw meats or poultry samples. AS

68

Effect of diet and type of birds on the carcass composition of broilers at 28, 49 and 59 days of age. Twining, P. V., Jr.; Thomas, O. P.; Bossard, E. H. *Poultry Science* 57 (2) 492-497 (1978) [27 ref. En] [Dep. Poultry Sci., Univ. of Maryland, College Park, Maryland 20742, USA]

2 studies were conducted to evaluate the effect of high or low protein diets on the body composition of broiler chicks at 28, 49 and 59 days of age; in the 2nd study, 2 broiler strains were also compared. In the low protein diets the protein and amino acid levels were reduced to approx. 80% of the levels in the control rations while maintaining the same calculated energy levels in both diets. Although not always statistically significant ($P < 0.05$) at each age period, the birds receiving the low protein diets had less carcass protein and moisture and more carcass fat than the birds receiving the high protein diets. In Study 2, Cobb \times Cobb broiler cross birds had a greater carcass protein and moisture content and less carcass fat than Hubbard \times Hubbard broiler cross birds at 28 and 59 days of age. Females consistently at all ages had less

carcass moisture and a greater carcass fat content than the males. AS

69

Sensory, physical, and microbiological comparison of brine-chilled, water-chilled, and hot-packaged (no chill) broilers.

Janky, D. M.; Arafa, A. S.; Oblinger, J. L.; Koburger, J. A.; Fletcher, D. L.

Poultry Science 57 (2) 417-421 (1978) [10 ref. En] [Florida Agric. Exp. Sta., Univ. of Florida, Gainesville, Florida 32611, USA]

% water uptake, thawing, and cooking losses were determined on broiler carcasses which had been ice-slush chilled (ice slush, 1° C overnight), brine chilled (5% NaCl, -1° C overnight), and hot packaged (no chill). After cooking, the meat samples were evaluated for flavour, tenderness, and juiciness by a taste panel. Shear force and % moisture analyses were also conducted. Carcasses and chill water were tested for microbial population throughout the experiment. Brine-chilled carcasses had significantly greater water uptake and lower thawing and cooking losses than conventionally-chilled carcasses. While all samples were scored favourably for flavour, tenderness, and juiciness, brine-chilled samples received higher scores than conventionally-chilled or hot-packaged samples. Meat from brine-chilled carcasses had a significantly higher moisture content and lower shear force values (more tender) than meat from conventionally-chilled or hot-packaged carcasses. Total plate and coliform counts were lower for both brine-chilled and conventionally-chilled carcasses than for hot-packaged carcasses. Adding salt to the chill water slightly decreased the microbial population in the chill water during chilling. AS

70

[Effect of freezing in liquid nitrogen on physicochemical meat characteristics of chicken broilers.]

Dobrzycki, J.; Hoser, A.

Zeszyty Naukowe Akademii Rolniczo-Technicznej w Olsztynie No. 178 (Special Issue), 55-66 (1977) [16 ref. Pl, ru, en] [Inst. Żywności i Żywnienia, Warsaw, Poland]

Dressed carcasses of 8-wk-old Lohman or Sussex \times Cornish chicken broilers were cooled in 3 stages on a Markert line to 4-5° C in the centre and were then either (i) frozen whole (wt, 1.0-1.2 kg) traditionally in a tunnel at -35° C air temp. for 20-24 h (tunnel capacity, 2 t/day) or (ii) frozen by liquid N₂ spraying in a British Oxygen Co. installation (capacity, 100 kg/h), in 20 min, the carcasses being smaller (0.9-1.0 kg) and halved for the purpose. After freezing, (i) and (ii) were stored at -18° C in batches of 30 carcasses or half-carcasses. Samples were examined before freezing and after storage for 1 wk or 3, 6 or 12 months. Defrosting was at 30° C for 1.5 h. The following measurements were carried out on separate muscles: pectoralis superficialis muscle, DM, pH, colour (optical density at 577 nm); biceps femoris muscle, DM, pH; semitendinosus muscle, water retention capacity; adductor femoris muscle, colour (optical density at 611 nm), acid value of fat. Contents of DM, protein and fat and pH of deboned,

ground carcasses or half-carcasses as well as defrosting loss, heat shrinkage and non-protein N in drip were determined. It is concluded from results tabulated in detail that wt. losses and non-protein N losses in drip were lower in (ii) than in (i); that there were no appreciable differences between (i) and (ii) in individual muscle characteristics; and that differences in stored carcasses were slight. The rate of increase in acid value of fat tended to be higher in (ii). SKK

71

Retention of bacteria on chicken skin after immersion in bacterial suspensions.

McMeekin, T. A.; Thomas, C. J.

Journal of Applied Bacteriology 45 (3) 383-387 (1978) [9 ref. En] [Dep. of Agric. Sci., Univ. of Tasmania, PO Box 252C, Hobart, Tasmania 7001, Australia]

Studies were conducted on retention of bacteria on the skin of freshly scalded and defeathered chicken legs dipped in suspensions of bacteria in quarter-strength Ringer's solution containing 0.001M EDTA in 0.01M phosphate buffer (pH 7.0) for known periods. Bacteria used were: *Pseudomonas* sp. group I strain A80; *Escherichia coli* M13; *Flavobacterium* sp. strain 25; and *Micrococcus* sp. strain OL18. Suspensions containing 10^4 - 10^8 cells/ml were used; the chicken legs were immersed for 5-25 min, drained for 30 s, a 16 cm³ portion of skin from the outside of each leg was macerated in saline using a Colworth Stomacher, and the bacteria were determined by surface spread plating. Numbers of bacteria retained were linearly related to bacterial count in the suspension ($r^2 = 0.96$), the slope of the log/log plot being close to unity. The time of immersion in the bacterial suspension had little effect on retention of bacteria, except for *Pseudomonas* sp. strain A80, for which there was a slight increase with time. No involvement of motility in retention of bacteria on the skin was observed. The results are discussed in relation to minimization of contamination of chicken skin with bacteria during chilling. AJDW

72

[Mn, Ni and Cu contents of chicken organs.] Über den Mangan-, Nickel- und Kupfergehalt in Hühnerorganen. Hoffmann, S.

Wiener Tierärztliche Monatsschrift 65 (8/9) 260 (1978) [De]

Mn, Ni and Cu contents were determined by AAS in various parts of 28 chickens, and gave the following mean contents (p.p.m. fresh wt. basis), resp.: liver 3.84 ± 2.10 , 0.54 ± 0.78 and 4.92 ± 1.54 ; breast muscle 0.15 ± 0.06 , 0.38 ± 0.27 and 0.64 ± 0.47 ; and heart 0.42 ± 0.13 , 0.41 ± 0.27 and 3.15 ± 1.20 . Results agreed well with published values and were not affected by age and sex. They do not suggest excessive accumulation of these trace metals from the environment. RM

73

[Effect of vegetable addition on chemical changes during storage in heat-treated chicken broiler meat.] Aleksiejczyk, Z.

Zeszyty Naukowe Akademii Rolniczo-Technicznej w Olsztynie No. 179 (Technologia Żywności 12), 115-171

(1978) [162 ref. Pl, ru, en] [Inst. Oświaty Rolniczej, ART, Olsztyn, Poland]

Breast and leg muscles from 180 carcasses of 10-wk-old LB-975 Lohman broilers (average wt. 2000 g), minced and mixed in the same proportion as in carcass (51.6 and 48.4%, resp.) were formed into fingers (wt., 110 g; length, 12 cm) either with 2% cooking salt only; or with 10% blanched Perfekcja carrot, Jabłkowy celery, Matador spinach or canned green peas. 2% salt being added to the mixture. The fingers were tightly wrapped in Al foil, cooked by moist heat in an electric oven at 176° C until they reached 84° C in the centre, cooled in the foil at 18° C for 12 h, packaged in it in batches of 3 in polyethylene bags and stored at 0° C for 30 days, or at -10° C for 3 or 6 months, or at -18° C for 3, 6 or 9 months. Data on contents of crude protein, total fat, ash, Cu, Fe, DM, malondialdehyde, pH, changes in lipid and fatty acid composition, free amino acids, coherence, cooking yield, and organoleptic assessment (all methods are referenced) are tabulated or graphically presented in detail for all experimental variants. Among the main conclusions were: oxidative changes in lipids occurred in processing and storage, their extent in storage depending on duration and temp.; the vegetable supplements exerted in general a protective effect, carrots and celery on phospholipids, and spinach on unsaturated fatty acids; all 3 of these vegetables accelerated storage loss of free amino acids; and their addition had no effect on storage changes in pH, coherence or organoleptic quality. SKK

74

[Control of fishy taint in broiler chickens. I. Effects of choline, methionine, vegetable oils and α -tocopherol.]

Wessels, J. P. H.; Preez, J. J. du; Atkinson, A.

Agroanimalia 10 (3) 27-34 (1978) [10 ref. Af, en, fr] [Visnywerheidnavorsingsinst., Univ. van Kaapstad, Rondebosch 7700, South Africa]

A series of trials on possible methods for reduction of the incidence of fishy taint in broiler chickens fed finisher diets containing $\leq 17\%$ fish meal is described. The diets were fed with or without supplements of methionine (2.865 g DL-methionine/kg diet), choline chloride (1 g/kg diet); α -tocopherol (15 mg/kg diet), or 2% crude or refined corn oil, or crude groundnut or cottonseed oil. Tables of data are given showing the flavour scores and fatty acid compositions of carcasses of broilers receiving the various diets. The results show that added choline chloride or methionine considerably improved the flavour of broilers fed low to medium levels of fish meal. Added crude or refined vegetable oils generally altered the fatty acid composition of carcass fats, and improved flavour. Studies on additive effects of the various feed supplements were inconclusive. Dietary α -tocopherol had little effect on the flavour of broilers. AJDW

75

[Control of fishy taint in broiler chickens. II. Effects of duration of finishing period.]

Wessels, J. P. H.; Jongh, J. H. de; Atkinson, A.; Preez, J. J. du

Agroanimalia 10 (3) 35-39 (1978) [4 ref. Af, en, fr]

[Visnywerheidnavorsingsinst., Univ. van Kaapstad, Rondebosch 7700, South Africa]

Studies were conducted to evaluate effects of the duration of the finishing period and the fish meal content of the finishing diet on the flavour of broilers. In 2 trials, a diet with 15% fish meal was fed for the first 28 days, followed by diets with 0, 5, 10 or 20% fish meal up to slaughter at 65 days of age. In a third trial, the broilers were fed diets with 10 or 17% fish meal for 6 wk, followed by diets with 0 or 10% fish meal for 2 wk. Tables of data are given showing flavour scores of broilers receiving the various diets. In general, flavour improved with increasing duration of finishing on a low-fish meal or fish meal-free diet; however, if high fish meal levels were fed before finishing, fishy taint was not fully eliminated over the finishing periods studied. Broilers were free from fishy taint when diets containing 0 or 5% fish meal were fed before the finishing period. [See preceding abstr. for part I.] AJDW

76

Classification and identification of food isolates from VRB and VRBG media.

Mercuri, A. J.; Cox, N. A.

Abstracts of the Annual Meeting of the American Society for Microbiology 78, 190 (1978) [En] [USDA, RRC, Athens, Georgia, USA]

Samples of chicken (broiler) skin, comminuted chicken meat, chicken pot pie, ground beef or pork sausage were diluted in 0.1% peptone and plated on Violet Red Bile agar (VRB) and Violet Red Bile agar with 1% glucose (VRBG). 30-40 typical isolates from each set of the VRB and VRBG plates were randomly selected and tested for gas production in lauryl sulphate tryptose broth (LST) at 35° C (presumptive coliform). LST-positive cultures were then tested for gas production in Brilliant Green Lactose Bile broth (BGLB) at 35° C (confirmed coliform). BGLB-positive cultures were tested for gas production in EC broth at 45.5° C (faecal coliform). All isolates were also identified to sp. by the 4 tube R-B Enteric Differential System and the API-20E system. Discrepancies between the 2 systems were resolved by conventional tests. Approx. 80% of the VRB isolates from broiler skin and from comminuted chicken met all the criteria for faecal coliforms. However, < 10% of the VRB isolates from chicken pot pie, ground beef or pork sausage were coliforms. As expected, proportions of the 3 coliform categories among VRBG isolates were less than among VRB isolates. *Escherichia coli* was the predominant sp. isolated on both media from broiler skin and comminuted chicken. *Enterobacter agglomerans* was the principal sp. isolated from chicken pot pie and pork sausage; *Serratia liquefaciens* predominated in ground beef. AS

77

A bacteriological study of roast chickens sold in the Cape Town municipal area.

Huskiison, J. M.; Venter, L.; Forder, A. A.

South African Food Review 5 (4) 21-22, 25 (1978) [4 ref. En] [Dep. of Med., Univ. of Cape Town, South Africa]

The possible bacterial contamination of roast chickens purchased at a cross section of 'take-away' food outlets in Cape Town was investigated. As a control, 1 chicken was cooked at home under normal domestic conditions and a raw frozen chicken purchased at a supermarket was studied for contamination. Contamination of chickens was studied from 3 viewpoints, aerial contamination (i.e. on display uncovered), contamination by hands of shop assistants and contamination arising due to infection before slaughter or through inadequate cleaning, using aseptic procedures. Of the 20 chickens studied, 14 showed evidence of bacterial contamination, the majority of the isolates being of faecal origin and/or potential food poisoning organisms. The control home-cooked chicken showed no evidence of contamination. No salmonellae organisms were isolated from any of the chickens sampled. It was concluded that such potentially hazardous conditions could be rectified by better communication and teaching basic hygiene principles to people involved at take-away outlets. Suggestions for legislation giving rise to safer food outlets and basic standards for handling food are also included. SP

78

Microfloral comparison of fresh and thawed frozen fryers.

Sauter, E. A.; Petersen, C. F.; Parkinson, J. F.

Poultry Science 57 (2) 422-424 (1978) [7 ref. En] [Dep. Anim. Sci., Univ. of Idaho, Moscow, Idaho 83843, USA]

Microflora of fresh and thawed frozen fryers were compared to determine potential public health significance of pigmented colonies of Gram-positive cocci observed on plates from defrosted frozen chicken. Numbers of NaCl tolerant bacteria were determined. Frozen fryers purchased from local stores and laboratory frozen fryers were thawed for 24 h at 3.3° C, split into halves, and packaged in polyethylene after swabbing of a 3 cm² area of the skin surface. Fresh fryers used for comparison were treated in a similar manner. All fryers were stored at 3.3° C, with bacterial samples taken on days 3 and 5, and then daily until odour spoilage. Bacterial numbers were enumerated using serial dilutions and plating with *Staphylococcus* 110 media, nutrient, and MPH agars. *Salmonella* detection was by use of Selenite enrichment followed by streaking on MacConkey and SS agars. Shelf life was similar, 7.9 days for fresh and 8.1 days for thawed frozen fryers. Initial counts of aerobic bacteria were similar, averaging 2.1×10^4 /cm². Numbers of salt tolerant bacteria were similar at day 1, averaging 1.1×10^3 /cm² and remaining constant at about this level on thawed frozen fryers until spoilage, but declining rapidly on fresh fryers. All salt tolerant bacteria were Gram-positive cocci, of which 52% were pigmented. Of pigmented isolates, 42% were coagulase positive. Subsequent identification indicated that most NaCl tolerant isolates producing bright yellow pigment were *Staph. aureus*. 3 *Salmonella* spp. were isolated from both fresh and thawed frozen fryers. Aerobic bacteria averaged 6.1×10^7 /cm² at odour spoilage, of which > 99% were *Pseudomonads*. AS

79

Emulsifying properties of proteins and meat from broiler breast muscles as affected by their initial pH values.

Kijowski, J.; Niewiarowicz, A.

Journal of Food Technology 13 (5) 451-459 (1978) [18 ref. En] [Inst. of Anim. Products Tech., Agric. Acad. of Poznan, ul. Wojska Polskiego 31, 60-624 Poznan, Poland]

Emulsifying capacity (ECA, g oil emulsified/100 mg protein) and emulsion stability (EST, ml drip/100 g emulsion) were measured for isolated proteins and sausage mixture prepared from (i) pale, soft and exudative, (ii) normal or (iii) dark, firm and dry broiler breast muscles. (i), (ii) and (iii) had, 15 min after slaughter, pH values of 5.7, 6.2 and 6.5, resp. The ECA of sarcoplasmic and myofibrillar proteins resp. were (i) 277.8, 425.3, (ii) 293.7, 441.2, and (iii) 281.2, 427. Differences from (ii) of (i) and (iii) were significant ($P = 0.01$). Mixtures of sarcoplasmic and myofibrillar proteins gave intermediate results. The corresponding EST values were (i) 78.5, 25.6, (ii) 52.1, 20.0, and (iii) 72.7 and 24.2. Differences from (ii) values were significant ($P = 0.01$). ECA values for sausage mixture suspension and proteins extracted from the mixture by 2% NaCl were, resp. (i) 178.2, 254.7, (ii) 177.4, 263.0 and (iii) 174.3, 258.8, resp. Differences between ECA values for sausage mixture were not significant, but EST values were highly dependent on the type of meat from which the sausage mixture was prepared. EST values found were (i) 13.7, (ii) 9.0, (iii) 16.4; differences from (ii) were significant, $P = 0.01$. The poor EST of sausage mixture from (iii) was unexpected. Broiler breast muscle was stored frozen at -18°C ; ECA values for proteins extracted by 2% NaCl and for meat suspensions decreased with frozen storage time. Differences from non-frozen samples were significant at $P = 0.05$ after 3 months for some samples and at $P = 0.01$ after 6 months for all samples. Although (ii) samples had the highest ECA values after storage, differences between (i), (ii) and (iii) were not statistically significant. EST also became poorer with increased frozen storage of a model emulsion. [See also following abstr.] DIH

80

Effect of initial pH in broiler breast muscles on gel forming capacity of meat proteins and on rheological characteristics of frankfurter-type sausage.

Kijowski, J.; Niewiarowicz, A.

Journal of Food Technology 13 (5) 461-468 (1978) [11 ref. En] [Inst. of Animal Products Tech., Agric. Acad. of Poznan, ul. Wojska Polskiego 31, 60-624 Poznan, Poland]

Gel forming capacity (GFC) of proteins extracted from broiler breast muscles of various initial pH values, as well as some technological and rheological characteristics of frankfurter-type sausages manufactured from normal, pale, soft and exudative (PSE) and dark, firm and dry (DFD) type muscles of broilers were investigated. Myofibrillar proteins showed generally a considerably higher GFC than sarcoplasmic proteins. Both proteins isolated from normal muscles (pH_{15} 6.2) demonstrated significantly better GFC than proteins from PSE (pH_{15} 5.7) and DFD

(pH_{15} 6.5) type meat. GFC was affected by the pH of the solution in a model system and showed an optimum at pH 6.0 for the 2 protein fractions and their mixture. Dynamic viscosity was markedly higher for myofibrillar than for sarcoplasmic proteins. No differences in viscosity were found between myofibrillar and sarcoplasmic proteins as influenced by pH_{15} in the muscles. Myofibrillar proteins produced a considerably more rigid gel, as measured by its linear strain, than did sarcoplasmic ones. Protein gels from normal muscles exhibited stronger consistency than those from PSE- and DFD-type muscles. Viscosity of sausage meat was highest in the samples originating from normal meat. Free water contents in model sausages increased with meat type in the order normal $<$ PSE $<$ DFD. Such rheological characteristics as linear, plastic, and elastic strains showed the best quality in sausage manufactured from normal meat. It was concluded that the initial condition of broiler breast muscles markedly affects some technological properties of meat and the quality of the ready-to-eat product. [See also preceding abstr.] AS

81

Radiation-resistant vegetative bacteria in a proposed system of radappertization of meats. (In 'Food preservation by irradiation' [see FSTA (1979) 11 4G311]) [Lecture]

Maxcy, R. B.; Rowley, D. B.

I, 347-359 (1978) [13 ref. En] [Dep. of Food Sci. & Tech., Univ. of Nebraska, Lincoln, Nebraska, USA]

After irradiation in the frozen state with 1 Mrad, fresh minced pork or chicken contained approx. 10-100 colony-forming units of highly radiation resistant asporogenous bacteria/g. Some of these had greater radiation resistance than *Clostridium botulinum* spores. Much of the radiation resistance was apparent as a shoulder in the death curve, which was markedly reduced by heating prior or subsequent to irradiation. Nature of the meat, e.g. variation in fat content (5-44%), had no significant effect on the radiation resistance of bacteria therein. Even though these bacteria were isolated from meat, it was not a favourable micro-environment for their growth. The water activity was too low. Heat sensitivity of isolates indicated the pre-irradiation enzyme inactivation treatment required for radappertization of meats would destroy or injure most vegetative cells. Thus, the combined process of heat, irradiation, and unfavourable micro-environment would ensure that these radiation resistant cells would not be a problem in radappertized meats. AS

82

Report on added water in bacon, ham and chicken. Hall, P. S.*Journal of the Association of Public Analysts* 16 (2) 33-38 (1978) [4 ref. En] [Dr Bernard Dyer & Partners (1948) Ltd., Analytical Lab., Peek House, 20 Eastcheap, London EC3M 1EL, UK]

17 Public Analysts' laboratories contributed and results were obtained for: (i) canned ham in natural juices, gelatin added; (ii) bacon, vacuum packed; (iii) bacon, open; (iv) vacuum packed ham; (v) open ham; (vi) whole chickens; and (vii) chicken pieces. Routine

analyses have indicated that these articles contain excessive amounts of added water. Results of analysing 292 samples of (i) showed a range between 53 and 108% of total meat: 65 samples or 22% contained over 20% of added water. Jelly varied from 4 to 37%. It is recommended that in addition to a min. meat content, a tolerance for the max. proportion of separable jelly should be established. 151 samples of bacon joints and rashers were examined. The distribution of results shows a max. meat content of 100%, but 29 samples showed figures below 90% meat. 98 samples of ham were examined, but 54 of the samples contained <90% meat. 99 results were reported for whole chicken carcasses. Figures as high as 30% of extraneous water were obtained. It is recommended that the max. content of extraneous water in frozen chickens should be not >5%. 25 chicken pieces were examined. Results were very similar to those for whole chickens. VJG

83

Marketing studies on cut-up chicken products. I. Consumer preference for cut-up chicken products and merchandising practices.

Sison, E. C.; Palispis, B. R.; Ortega, E. R.
Philippine Journal of Veterinary and Animal Sciences 1 (3) 241-249 (1975) [3 ref. En] [Univ. of the Philippines at Los Banos, Laguna, Philippines]

Consumer preference surveys were conducted on 355 randomly-selected consumers at the University of the Philippines at Los Banos, Laguna, and at Malabon, Rizal. Tabulated results give data on income and geographical distribution of the families surveyed, habitual purchases of fish, beef, pork and chicken, purchase of live and dressed chicken and for preferences for cut-up chicken products in relation to presentation (whole chicken cut up and sold as one unit, chicken parts, combination of chicken parts, fresh and frozen cut-up chicken products, packaging method). RM

84

Marketing studies on cut-up chicken products. II. Influence of family income per capita on consumer preference for cut-up chicken products.

Sison, E. C.; Palispis, B. R.; Ortega, E. R.
Philippine Journal of Veterinary and Animal Sciences 1 (3) 250-256 (1975) [4 ref. En] [Univ. of the Philippines at Los Banos, Laguna, Philippines]

Results from the surveys on consumer preferences for live, dressed and cut-up chickens were analysed by socio-economic groups. Tabulated data showed that higher income groups preferred dressed to live chickens, and chicken parts to whole dressed chickens. RM

85

Low-dose irradiation of fresh, non-frozen chicken and other preservation methods for shelf-life extension and for improving its public-health quality. (In 'Food preservation by irradiation' [see FSTA (1979) 11 4G312]) [Lecture]

Kahan, R. S.; Howker, J. J.
II, 221-242 (1978) [76 ref. En] [Soreq Nuclear Res. Cent., Yavne, Israel]

Fresh eviscerated broiler chicken, both with salt treatment (part of kosher processing) and without, were γ -irradiated and stored at $-1, 0, +1.6$ and $+4.4^\circ\text{C}$ for ≤ 31 days. At intervals samples were withdrawn for microbial, physical and sensory evaluations. Combination of a 250 krad irradiation dose and storage at 1.6°C were adequate for a radurized chicken process. The product was free from microbial spoilage and of excellent quality for at least 15 days and, in addition, was essentially free from *Salmonella* and other organisms of public-health significance. It is therefore proposed that the doses recommended recently by the Joint FAO/IAEA/WHO Committee are unnecessarily high and should be markedly reduced. A 500 krad dose caused marked flesh discolouring without improving the microbiological or enzymic preservation, and this is likely to be found generally true for commercial poultry flocks under veterinary inspection. Flesh discolouring of chicken treated with 300 krad is unlikely to be detectable by the untrained eye and a max. dose of 300 krad should be the target for non-frozen chicken irradiation processes. AS

86

The interrelated effects of feeding diet combinations with different protein and energy levels to males and females of commercial broiler genotypes.

Proudfoot, F. G.; Hulan, H. W.
Canadian Journal of Animal Science 58 (3) 391-398 (1978) [12 ref. En] [Res. Sta., Agric. Canada, Kentville, Nova Scotia B4N 1J5, Canada]

6000 broiler chickens were used in 2 feeding trials conducted to evaluate effects of sex, genotype (4 commercial genotypes being compared) and feeding regimes (various combinations of protein and metabolizable energy levels fed in starter/finisher or starter/grower/finisher regimes) on performance and carcass quality. Tables of results are given, including data for the eviscerated wt. and the % grade A carcasses. Eviscerated wt. was significantly influenced by sex, genotype and some variants of the starter/finisher regimes; % grade A carcasses was significantly influenced by genotype and starter/finisher regime. No significant diet \times sex interaction was observed. AJDW

87

Energy expended in alternate food service systems for chicken menu items.

Unklesbay, N.; Unklesbay, K.
Journal of the American Dietetic Association 73 (1) 20-26 (1978) [8 ref. En] [Dep. of Food Sci. & Nutr., Univ. of Missouri-Columbia, Missouri, USA]

An energy-accounting model was developed for use in different types of food service systems to determine accumulated energy expenditures/documentated units of nutrients in menu items processed for service. The 6 process steps required for the initial production of a baked chicken entree in a conventional food service operation are defined. The model was applied to chicken menu items (baked chicken variations, fried chicken and chicken cacciatore) in 4 types of food service systems; conventional, cook/chill, and assembly/serve - preplated and bulk. Comparisons

among the data indicated large variations in BTUs expended/wt. of chicken menu item processed for service. Several implications were made as to how the application of this energy-accounting model can be used to identify areas in which energy can be used more effectively. VJG

88

[Biological value of new infant foods stabilized with different types of starch.]

Petrovskii, K. S.; Khovaeva, L. A.; Terekhin, S. P.; Gonotskii, V. A.; Korotaeva, M. M.

Voprosy Pitaniya No. 1, 49-52 (1979) [8 ref. Ru, en] [I Moskovskii Meditsinskii Inst. im. I. M. Sechenova, Moscow, USSR]

Homogenized canned chicken baby foods (Kroskha brand) were made with 3 different var. of starch stabilizer (maize, amylopectin or potato), each in the native and modified (phosphate) forms (2% by wt.). Animal feeding tests indicated that the modified starches were nutritionally inferior to the native forms, whose nutritive value was potato > amylopectin > maize. HBr

89

A comparison of three methods of food restriction of laying-type pullets on growth and laying performance.

Gous, R. M.

British Poultry Science 19 (4) 441-448 (1978) [13 ref. En] [Dep. of Anim. Sci. & Poultry Sci., Univ. of Natal, Pietermaritzburg 3200, South Africa]

3 methods of restricting the growth rate of pullets from 8 to 20 wk of age were compared. They were: quantitative food restriction, a diet low in lysine and arginine, and a low protein diet. Food consumption up to 20 wk of age was significantly reduced by all 3 treatments; mortality was increased and sexual maturity was delayed. Results of carcass analyses are given. Pullets fed a low lysine diet had a high body fat content at 20 wk. Although not significantly greater than the body fat content of the pullets fed ad lib., that of the pullets reared on the low lysine diet was significantly greater than that of the pullets in either of the other treatments. VJG

90

The effects on broiler chicken of polyphosphate injection during commercial processing. I. Changes in weight and texture.

Grey, T. C.; Robinson, D.; Jones, J. M.

Journal of Food Technology 13 (6) 529-540 (1978) [18 ref. En] [Food Res. Inst., Colney Lane, Norwich NR4 7UA, UK]

Broiler carcasses were injected with 5% polyphosphate solution prior to immersion chilling, and effects on wt. change during chilling, thawing and cooking were studied. Carcasses were injected with the normal dose of solution, 4.7% of eviscerated wt., or with 0.5× or 2× this dose. Polyphosphate injection had no significant effects on % wt. changes from chilling to cooking, but injected carcasses were heavier than uninjected carcasses at all stages because of wt. of injected solution. Fluid equivalent to 80% of liquid

injected was retained after cooking. Effect of injection of polyphosphate on texture of cooked muscle was studied; mean force to shear (kg, with s.d. in parentheses) for breast muscle from control and injected (normal dose) groups (30 samples each) was 1.99 (0.55) and 1.55 (0.49), resp. The texture of the injected muscle was significantly lower than that of the control at the 1% level of significance. Measurement of polyphosphate concn. of breast muscle showed that no significant loss of phosphate occurred during immersion chilling, but ≤30% of polyphosphate (as P₂O₅) injected was lost between injection and chilling (fluid was seen to drain from injection holes). DIH

91

The effects on broiler chicken of polyphosphate injection during commercial processing. II. Sensory assessment by consumers and an experienced panel. Griffiths, N. M.; Wilkinson, C. C. L.

Journal of Food Technology 13 (6) 541-549 (1978) [9 ref. En] [Food Res. Inst., Colney Lane, Norwich NR4 7UA, UK]

Broiler chicken carcasses were injected with 4.5% by (eviscerated) wt. of a 5% polyphosphate solution prior to immersion chilling and freezing. Chickens were cooked and evaluated by consumers in their own homes or were cooked under standard conditions and evaluated by a laboratory sensory assessment panel or a consumer preference panel. Injected chickens were rated as significantly more tender and more juicy than non-injected chickens (significant at 0.1% probability level). In the home assessment, 32-45% of consumers (1090 individuals) did not distinguish between injected and non-injected groups, but of those that did distinguish, >50% rated the polyphosphate group as more tender and more juicy. 54% of households preferred the polyphosphate-injected chickens, 36% the non-injected, and 10% had no preference. In side-by-side consumer preference trials (265 assessors) the corresponding values were 41% for injected, 47% for non-injected, and 12% no preference. [See preceding abstr. for part I.] DIH

92

Growth, isolation, and enumeration of mycoplasmas in certain foods.

Rudrik, J. T.; Jay, J. M.

Abstracts of the Annual Meeting of the American Society for Microbiology 78, 194 (1978) [En] [Wayne State Univ., Detroit, Michigan, USA]

Although mycoplasmas are known to occur in slaughter animals and are frequently isolated from man, few if any reports exist on their incidence and prevalence in meats. In this study SPC methods were adapted to compensate for their mechanical and osmotic fragility. 2 type strains of *Acholeplasma* were subjected to shaking, vortexing, blending, centrifugation, and membrane filtration. Vortexing for 10 s or shaking 25 times resulted in counts slightly higher than controls, while blending for 2 min reduced counts. The order of efficacy of the 5 diluents tested for organism survival over a 2-h period was heart infusion broth > 0.25M saline (pH 7.2) > 1.0M sucrose > peptone

water > Butterfield's phosphate buffer (pH 7.2). When inoculated as pure cultures into sterile ground beef and ground chicken, neither *A. axanthum* nor *A. laidlawii* grew in beef. Only *A. axanthum* grew well in chicken. A 3-log cycle increase of *A. axanthum* occurred in chicken in association with *Serratia marcescens* which increased approx. 6 log cycles. Lack of growth in beef may be due to its pH of <6.0. Although TSA supported better growth than PCA, a BHI-basal medium + yeast extract + serum fraction yielded colonies with the characteristic 'fried egg' appearance. These findings indicate that mycoplasmas grow at least in poultry meats, and may be recovered by surface plating into suitable agar containing penicillin, cycloheximide, and thallium acetate. AS

93

Rapeseed meals in broiler diets: effect on performance and sensory evaluation of carcasses.
Yule, W. J.; McBride, R. L.

British Poultry Science 19 (4) 543-548 (1978) [12 ref. En] [NSW Dep. of Agric., Poultry Res. Sta., PO Box 11, Seven Hills, NSW 2147, Australia]

The effect of including rapeseed meal (RSM) in lieu of soybean meal in broiler diets was determined. Live-wt. gains, from 8 to 63 days, were depressed when the diet contained 150 g RSM/kg and there was a highly significant negative correlation between wt. gain and inclusion rate of RSM over this period. Carcasses from birds fed on diets containing 10 g tallow/kg had a better appearance than those from birds on diets containing 30 g tallow/kg, while the flavour of meat from birds fed on a diet containing 150 g solvent RSM/kg treatment was adversely affected. However, up to 100 g solvent RSM/kg may be included in broiler diets without affecting appearance, taste, texture or acceptability of the meat. AS

94

Dietary selection of protein and energy by pullets and broilers.

Summers, J. D.; Leeson, S.

British Poultry Science 19 (4) 425-430 (1978) [9 ref. En] [Dep. of Anim. & Poultry Sci., Univ. of Guelph, Guelph, Ontario, Canada]

White Leghorn pullets and sexed broilers were allowed a free choice of two "split-diets" which were concentrated sources of either crude protein (463 g/kg diet) or energy (13.32 to 14.00 MJ/kg diet). Pullets receiving these two diets displayed a slower, but more uniform growth rate than did birds offered a single conventional diet. By 6 wk of age, male birds had more carcass fat than did female birds. Projection of this data to other classes of poultry may be of significance. Up to 11 wk of age, control birds consumed significantly more protein while the converse was true from 11 to 20 wk. These differences are discussed in relation to the stage of sexual maturity. Broilers offered the split-diets grew more slowly and had an inferior food conversion ratio compared with control birds fed on a two-stage rearing programme. AS

95

The influence of factory processing on the development of rigor in the breast muscle of broilers.
Grey, T. C.; Jones, J. M.

British Poultry Science 18 (6) 671-674 (1977) [En] [Food Res. Inst., Colney Lane, Norwich, NR4 7UA, UK]

Chickens were stunned electrically, killed and bled for 2 min, scalded at 50° C for 2 min, mechanically plucked and manually eviscerated. Carcasses were washed for 15 min in a mechanical immersion chiller with running tap water at 14° C and then passed through a second tank containing water and ice at 1-3° C. They were blast frozen at -39° C for 2 h. Chickens were removed from the processing line after bleeding, immersion washing, immersion chilling and after immersion chill, blast freezing and thawing overnight. The texture of the breast muscle was compared with some of the major biochemical constituents. The pH value at which no ATP would be present is 5.75 in the case of laboratory killed chickens whereas with the factory processed chicken it was 5.82. The pH value of the breast muscle of factory processed chicken can therefore be used as a useful guide to the ATP concn. in the muscle. The effect of blast freezing and thawing demonstrated the continuation of the ageing process after immersion chilling, i.e. 1 h post mortem. The texture measurements suggest that the meat slightly increased in toughness during the early stages of processing. Subsequent blast freezing and thawing resulted in a considerably more tender product. VJG

96

Comparison of storage time-temperature effects on sensory and hedonic attributes of frozen and deep-frozen chickens.

Frijters, J. E. R.; Beumer-Stoffer, S. C. C.

British Poultry Science 19 (2) 225-232 (1978) [17 ref. En] [Spelderholt Inst. for Poultry Res., Min. of Agric. & Fisheries, Beekbergen, Netherlands]

Broilers were stored at $-12 \pm 1^\circ \text{C}$ and $-18 \pm 1^\circ \text{C}$ for 9 periods of ≤ 24 and 36 months resp. and compared with birds stored at $-43 \pm 2^\circ \text{C}$. There were negligible differences in preference between the experimental and reference grilled breast meats. Odour preference differences for thawed, uncooked birds were significant after 1 month of storage at -12°C and after 9 months at -18°C . In comparison with the reference birds the redness of frozen and thawed birds decreased more regularly during storage at -12°C than at -18°C . Packaging the birds in Cryovac instead of in polyethylene resulted, in the raw birds, in a greater difference in surface redness. This redness decreased more rapidly during storage than that of birds packaged in polyethylene. AS

97

[The effect of transport stress on the meat properties of broilers.] Einfluss der Transportbelastung auf die Fleischbeschaffenheit von Broilern.

Ristic, M.

Fleischwirtschaft 58 (6) 1031-1034; 964 (1978) [11 ref.

De, en] [Bundesanstalt für Fleischforschung, 8650 Kulmbach, Federal Republic of Germany]

Meat samples of 200 broilers slaughtered at 42 days after transport of 10–90 km (10–90 min) were examined for physical properties 15 min–24 h post mortem, and sensory properties and tenderness before and after cooking. Results shown graphically and in tables were as follows: Initial and final pH (15 min, and 24 h) in the breast and thigh muscles from animals transported 10, 15, 20 and 90 km showed normal glycolysis, while 45 km journey resulted in delayed glycolysis (higher initial and final pH). Colour of the meat darkened with increasing length of transport. A 45 km journey produced lowest values for consistency (rigor value in breast and thigh 24 h post mortem 11.9 and 10.8 resp.). The liquid area of the breast meat 15 min post mortem was best after a 20 km journey (4.00), it deteriorated at 24 h post mortem after 90 km (from 7.73 to 8.35 cm²). A 45 km journey gave significantly better juiciness and aroma scores. Correlation existed between pH and consistency ($r = -0.48$), and between pH and juiciness ($r = 0.42$). Results showed that transport stress during journeys of around 45 km resulted in delayed glycolysis but had no significant effect on tenderness. RM

98

Effect on different levels of dietary protein and energy on weight and certain qualities of ready-to-cook broilers.

Prasad, A.; Sadagopan, V. R.

Indian Journal of Nutrition and Dietetics 15 (3) 76–79 (1978) [10 ref. En] [Div. of Poultry Res., Indian Vet. Res. Inst., Izatnagar, Uttar Pradesh, India]

Crossbred commercial broiler chicks, 14 wk of age were fed with experimental rations containing 2 dietary protein levels (DPL) (20 and 23%) each at 2 metabolizable energy (ME) (2800 and 3100 kcal/kg) levels and their effect on: (i) ready-to-cook wt. (g); (ii) breast angle; (iii) texture; (iv) flavour; (v) liver wt. (as g/100 g carcass wt.) and (vi) liver fat % was evaluated after 6 wk. Higher DPL increased (i) and (ii) but showed no effect on (iii)–(vi). Increase in ME, at both DPL, did not influence (i)–(iv) of cooked broilers but decreased (v) and increased (vi). Thus, with 23% DPL and 2800 kcal/kg ME, broilers could produce relatively heavy good quality carcasses. CFTRI

99

Fumigation of poultry food with methyl bromide: effects on flavour and acceptability of broiler meat.

Griffiths, N. M.; Hobson-Frohock, A.; Land, D. G.; Levett, J. M.; Cooper, D. M.; Rowell, J. G.
British Poultry Science 19 (4) 529–535 (1978) [19 ref. En] [Food Res. Inst., Colney Lane, Norwich NR4 7UA, UK]

Broilers were fed on control and treated commercial diets to test the effects of fumigation with methyl bromide gas at 69% and 25% over the value recommended for the elimination of salmonellae. In the first experiment roasted broilers were assessed for flavour as 'fresh' birds (max. storage 60 h at 1° C) and for flavour and odour after storage for 1–4 wk at –20° C with subsequent thawing overnight at 20° C. In the second experiment birds were assessed for odour

only. The assessors used the scale: 0 (control), no difference; to 4, large difference. The mean flavour and odour difference ratings for coded controls and treated samples show that birds fed on methyl bromide-treated food were significantly different from the controls. Only 2 out of the 40 treated birds which were assessed were given mean ratings < 1.0 and none of the control birds was given a mean rating > 1. Similar odour differences for the stored birds were given for both treatment levels and there was no significant difference between breast and leg meat or between males and females. More than half the consumers in a home panel rated the control birds better than the birds fed on fumigated food. VJG

100

Stability of abdominal fat and meat of broilers: effect of duration of feeding antioxidants.

Bartov, I.; Bornstein, S.

British Poultry Science 19 (1) 129–135 (1978) [12 ref. En] [Div. of Poultry Sci., Agric. Res. Organization, Volcani Cent., Bet Dagan, Israel]

The α -tocopherol (AT) content of abdominal fat and fat stability increased as a function of the duration of α -tocopheryl acetate (ATA) feeding in broilers fed on diets containing either 40 g acidulated soybean-oil soapstock (ASS) or tallow/kg. A linear relationship was observed between AT content of the adipose tissue and its stability with both types of fat supplements. The stabilities of carcass fat and meat of 9-wk-old broilers fed on diets containing ASS with 300 mg ethoxyquin (EQ)/kg or diets containing tallow with 20 mg ATA/kg from wk 5 to 9 were comparable with those obtained by feeding these antioxidants and fats throughout the growth period. ATA added to a diet containing ASS, and EQ added to a diet containing tallow did not improve meat stability despite such an effect on adipose tissue when fed for 9 wk. The results emphasise the importance of using the dietary antioxidant appropriate to the fat supplement to improve carcass stability. AS

101

Emulsion capacity and timed emulsification of chicken breast muscle myosin.

Galluzzo, S. J.; Regenstein, J. M.

Journal of Food Science 43 (6) 1757–1760 (1978) [18 ref. En] [Dep of Poultry Sci. & Food Sci., Cornell Univ., Ithaca, New York 14853, USA]

Methods are described for the study of the role of muscle proteins in meat emulsion formation. Chicken myosin was used to optimize emulsifying capacity (EC) and timed emulsification conditions for a Sorvall Omni-mixer equipped with 50 ml polycarbonate tubes. Optimal conditions for EC were a 0.9–1.2 ml sample vol., 6000 rev/min mixing rate and 0.25 ml oil/s addition rate. The oil (coloured with 0.3 g Oil Red O/l. oil) was kept at < 6° C, and the EC test was done in an ice bath. EC was fairly constant over the 0.3–1.0M NaCl range, decreasing when salt concn. fell to 0.10M. Optimal conditions for timed emulsification were 3 ml sample:6 ml oil, and a 6000 rev/min mixing rate for ≤ 5 min. Creaming of the emulsions was accomplished by centrifugation at $30\,000 \times g$, for 15 min. The aqueous phase was then analysed via the Lowry method and by SDS (sodium dodecyl sulphate) gel electrophoresis. Myosin exhibited 4 bands, the heavy

chain and the 3 light chains, which could be monitored by using both 6% and 12% SDS gels and an actin internal standard. Densitometric areas were converted to mole:mole ratios using a dye-binding factor of 1.0. IFT

102

Role of chicken breast muscle proteins in meat emulsion formation: myosin, actin and synthetic actomyosin.

Galluzzo, S. J.; Regenstein, J. M.

Journal of Food Science 43 (6) 1761-1765 (1978) [13 ref. En] [Dep. of Poultry Sci. & Food Sci., Cornell Univ., Ithaca, New York 14853, USA]

The chicken breast muscle proteins myosin, actin and synthetic actomyosin (SYAM) were taken to 0.6M NaCl, 20mM citrate-phosphate buffer, pH 5.5-7.0, and were tested for emulsifying capacity (EC) and timed emulsification. The aqueous phase was separated by centrifugation and analysed quantitatively by SDS gel electrophoresis. EC values varied inversely with protein concn. and pH, in the order myosin approx. = SYAM (+ ATP) > SYAM (- ATP) > actin. However, oil phase vol. differences were small, ranging from 86.5 to 88.7%. The proteins actin and myosin had quite different emulsion-forming properties. Myosin was rapidly removed from solution, forming fine, thick emulsions. Actin was less readily removed from solution, and formed thin, coarse emulsions. When present as actomyosin, actin and myosin behaved like myosin alone. However, when this complex was dissociated by ATP (5mM), actin and myosin behaved independently of each other. Actin remained in the aqueous phase while myosin was preferentially used in the emulsion. [See also preceding abstr.] IFT

103

Role of chicken breast muscle proteins in meat emulsion formation: natural actomyosin, contracted and uncontracted myofibrils.

Galluzzo, S. J.; Regenstein, J. M.

Journal of Food Science 43 (6) 1766-1770 (1978) [9 ref. En] [Dep. of Poultry Sci. & Food Sci., Cornell Univ., Ithaca, New York 14853, USA]

Natural actomyosin (NAM) and glycerinated myofibrils (contracted and uncontracted) from chicken breast muscle were taken to 0.6M NaCl, 20mM citrate-phosphate buffer (pH 7) and tested for emulsifying capacity (EC) and timed emulsification. Myofibrils were extracted for 0, 1, or 24 h in the buffer prior to testing. The aqueous phase was separated by centrifugation and analysed quantitatively by SDS gel electrophoresis. The EC of NAM was lower than that reported earlier for myosin, but was equal to it with added ATP or pyrophosphate. The EC of myofibrils varied considerably depending upon whether the 0.6M NaCl soluble protein or the initial protein concn. was used as the denominator. Timed emulsification studies showed that actomyosin was removed from solution in a manner similar to myosin alone. However, when this complex was dissociated, actin remained in the aqueous phase, while myosin was preferentially used in the emulsion. The same relationship was displayed in myofibrils. The regulatory proteins tropomyosin and

troponin exhibited a behaviour independent of both actin and myosin. Tropomyosin always increased in the aqueous phase relative to myosin regardless of the presence or absence of ATP, while the troponins were more readily removed from solution in the presence of ATP. [See also preceding abstr.] IFT

104

The use of air-coolers in broiler houses under subtropical conditions in Iraq.

Al-Zujajy, R. J.; El-Hammady, H.; Abdulla, M. A.

British Poultry Science 19 (6) 731-735 (1978) [10 ref. En] [Anim. Production Dep., Coll. of Agric., Sulaimaniya Univ., Iraq]

Under summer conditions in north Iraq, 2000 chicks were reared for 56 days in 2 broiler houses, densities of 8 to 16 birds/m². 1 house was provided with 2 air coolers. Differences in wt. gain between birds in cooled and uncooled houses ranged from 101.5 g at 8 birds/m² to 385 g at 16 birds/m². The dressed carcass and edible meat % were closely related to body wt. in both environmental conditions. Carcass wt. and carcass finish were much better in the cooled house than in the uncooled house especially at high bird densities. VJG

105

Storage time-temperature effects on the odour preferences for uncooked chicken parts.

Frijters, J. E. R.; Beumer-Stoffer, S. C. C.

British Poultry Science 19 (6) 737-740 (1978) [5 ref. En] [Spelderholt Inst. for Poultry Res., Min. of Agric. & Fisheries 7361 DA Beekbergen, Netherlands]

Whole broilers and separated legs were stored at $-12^{\circ} \pm 1^{\circ} \text{C}$, $-18^{\circ} \pm 1^{\circ} \text{C}$ and $-75 \pm 2^{\circ} \text{C}$ (reference group, whole carcasses only), for up to 9 months. Legs cut from the whole birds after removal from store, unpacking and thawing, and legs from the portions were compared in odour preference at four times of examination. After only 1 day the odour of the legs stored as parts at -12°C was less preferred than that of the reference group; this was also true for legs cut from whole birds after 3 months at the same temp. After 3 months at -12°C the odour of the legs stored as parts was less preferred than the odour of legs obtained from whole birds. Storage of legs as parts at -18°C resulted in a comparatively less preferred odour after 3 months, while the same was true after 9 months for legs cut from the carcasses. AS

106

Specification for dressed chicken.

Barbados, Barbados National Standards Institution

Barbados National Standards BNS 39:1978, 10pp. (1978) [En] [Culloden Road, St. Michael, Barbados, West Indies]

The hygienic requirements for the dressing plant, requirements for the live bird and requirements for chilled or frozen dressed (eviscerated) chicken are described. Methods of sampling are described, and test samples must conform with requirements listed for 2 quality grades. DIH

107

The fate of enterotoxigenic bacteria inoculated onto Chinese barbecued foods.

Stiles, M. E.; Ng, L.

Canadian Journal of Public Health 68 (5) 389-394 (1977) [18 ref. En, fr] [School of Household Economics, Univ. of Alberta, Edmonton, Alberta, Canada]

Enterotoxigenic bacteria inoculated at low concn. (3×10^1 – 8×10^3 /g) onto Chinese barbecued foods had a longer lag phase at 30°C than the same organisms inoculated onto commercially prepared rotisserie chickens. Although the Chinese barbecued food appeared to delay the growth of some of the enteropathogenic organisms, growth had usually commenced after 5–8 h incubation at 30°C, and populations of 10^7 – 10^8 cells/g were achieved. The results indicated that Chinese barbecued products require storage outside of the temp. 'danger zone' (4.4–60°C), in accordance with Canadian Food & Drug regulations, to prevent growth of these potentially pathogenic bacteria. AS

108

Utilisation of dried poultry manure by growing chickens fed on a practical diet.

Ogunmodede, B. K.; Aninge, A. J.

British Poultry Science 19 (2) 137-141 (1978) [8 ref. En] [Univ. of Ibadan, Ibadan, Nigeria]

Dried poultry manure (DPM) was tested as a replacement for groundnut cake in poultry diets. Body wt. gain, and the efficiency of food conversion were improved when the diet contained 50 g DPM/kg but higher rates of inclusion (100 or 150 g/kg) depressed growth. Birds fed on diets containing 50 g DPM/kg yielded meat of comparable quality to those fed on the control diet whereas those fed on diets containing more DPM yielded meat containing more fat and less water. The % moisture in the meat was inversely related to the lipid content. N retention was comparable in all groups. AS

109

Utilization of algae protein (*Scenedesmus acutus*) in chick rations.

Reddy, V. R.; Reddy, C. V.; Varadarajulu, P.; Venkat Reddy, G.

Indian Poultry Gazette 62 (2) 67-70 (1978) [11 ref. En] [Dep. of Poultry Sci., Coll. of Vet. Sci., Andhra Pradesh Agric. Univ., Rajendranagar, Hyderabad-500 030, India]

Chickens were fed algal protein at 5% level, in place of fish meal, with or without added methionine (at a level of 0.1% of the diet). Protein content was significantly higher in the carcasses of chickens receiving algal protein, either with or without methionine, than in carcasses of control chickens. It is concluded that algal protein could be used in poultry rations in place of fish meal. CFTRI

110

Extraction of proteins in fresh chicken muscle.

Mahindrakar, N. S.; Moorjani, M. N.

Journal of Food Science and Technology, India 14 (5) 223-224 (1978) [6 ref. En] [Cent. Food Tech. Res. Inst., Mysore, India]

Extractability of protein in red and white muscle of chicken was studied after ageing in ice. Extractability of protein increased after 4 h ageing and remained almost the same even after 24 h of ageing. Protein extractability was higher in white muscle than red muscle. AS

111

Microbiological condition of broilers as influenced by vacuum and carbon dioxide in bulk shipping packs.

Bailey, J. S.; Reagan, J. O.; Carpenter, J. A.; Schuler, G. A.

Journal of Food Science 44 (1) 134-137 (1979) [25 ref. En] [Food Sci. Dep., Univ. of Georgia, Athens, Georgia 30602, USA]

Bulk vacuum/gas packs of broilers were examined microbiologically and organoleptically in tests to determine effects of storage temp., film permeability, CO₂ level and vacuum level on acceptability and shelf-life of fresh-processed poultry. Total aerobic bacterial counts and off-odour development were determined after 5-18 days of storage in bulk packs and again after 2-7 more days of storage in a retail case. Significantly lower microbial counts and extended shelf-life were found when storage was at 2°C instead of 5°C, after 12 days storage when low permeability packaging film was used instead of high permeability film and after 15 days of storage when 65% CO₂ was used instead of 20% CO₂. No significant difference in microbial counts was found when a pinhole was made to simulate leaking or torn bulk packs. Gram stains of bacteria from total plate counts and type of off-odour observed indicate spoilage of vacuum/gas packaged broilers was caused by different bacteria from those causing spoilage of ice-packed broilers. IFT

112

Characteristics of broiler meat skin as affected by different cooking methods.

Chen, T. C.; Stinson, R. S.

Journal of Food Science 44 (1) 312-313 (1979) [3 ref. En] [MAFES, Poultry Sci. Dep., Mississippi State Univ., State College, Mississippi 39762, USA]

Broiler portions were treated in the following ways: (i) noncooked raw portions; (ii) boiled in water for 20 min; (iii) baked at 218°C for 1 h with and without batter and breading; and (iv) deep fat fried at 182°C for 7 min with and without batter and breading. Wt. per unit area, and moisture, and fat contents of the breast and the thigh skin were determined. It was found that the thigh skin weighed less (g/in²) but contained more fat than the breast skin regardless of the cooking method. Wt., moisture and fat contents of skin were greatly affected by the cooking methods. Skin samples were taken from the same breast location and fixed in glutaraldehyde and OsO₄. Specimens were then dehydrated, critical-point dried, coated with gold and observed using a scanning electron microscope. Water boiled skin had a relatively smooth surface; fried skin had numerous crater-like structures, while baked skin had few crater-like structures. IFT

113

Scanning electron microscopy of microorganisms on chicken skin.

McMeekin, T. A.; Thomas, C. J.

Journal of Applied Bacteriology 46 (1) 195-200 (1979) [9 ref. En] [Dep. of Agric. Sci., Univ. of Tasmania, PO Box 252C, Hobart, Tasmania 7001, Australia]

Samples of chicken skin were taken from carcasses immediately after immersion chilling, and from frozen and thawed carcasses after ≤ 10 days at 5°C . Samples were fixed with glutaraldehyde or OsO_4 and examined by scanning electron microscopy. Samples fixed with glutaraldehyde showed channels in the skin surface, of size $< 10\ \mu\text{m}$. At high magnifications fibrils connecting microorganisms on skin surface were visible. When OsO_4 was used as fixative the epithelial cells were not visible, as a layer of material, in which bacteria developed, covered them. This layer was present immediately after immersion chilling and became more evident in samples from stored carcasses. Presence of the surface channels and the layer of material explains the higher values for microbial counts obtained by destructive sampling techniques than by non-destructive techniques such as swabbing or rinsing. DIH

114

[Results of the national broiler test 1977.]

Keppens, L.; Moermans, R. J.; Groote, R. de
Revue de l'Agriculture 31 (2) 337-349 (1978) [3 ref. Fr, en] [Cent. de Recherches Agron. de l'Etat a Gand, Burg Van Gansberghelaan 92-8-9220 Merelbeke, Belgium]

Results of the Belgium broiler test involving 4 breeding farms and 7 commercial crosses are shown in tables. The mean total dressing % (ready to cook wt. without gizzard) was 68.8%, mean for males 69.2%, for females 68.5%, and was not significantly affected by breed and sex. RM

115

Histochemistry of the chicken skeletal muscles.**II. Distribution and diameter of three fiber types.**

Suzuki, A.

Tohoku Journal of Agricultural Research 29 (1) 38-41 (1978) [15 ref. En] [Dep. of Anim. Sci., Fac. of Agric., Tohoku Univ., Sendai, Japan]

Studies on muscle fibre types and diam. from various parts of the biventer cervicis, pectoralis thoracicus, iliotibialis lateralis and flexor cruris medialis muscles of adult White Leghorn chickens and 6-wk-old White Leghorn or commercial hybrid chickens are described. The fibres were classified on the basis of NADH-diaphorase and alkali-stable myosin ATPase activity: the diam. of fibres of the various types were also determined. Tables of results are given. Differences between the muscles studied in distribution of fibre types and diam. are discussed. AJDW

116

Tallow replacing corn as a source of energy in broiler rations.

Kazemi, R.; Amin, M.

Archiv für Geflügelkunde 42 (5) 197-200 (1978) [16 ref. En, de, fr, ru] [Dep. of Anim. Sci., Coll. of Agric.,

Univ. of Tehran, Iran]

500 2-wk-old commercial broiler chicks were used in a study on partial replacement of corn by tallow in the diet on performance and carcass fatness. Diets tested contained 0, 1, 2, 3 or 4% tallow, 1 part of tallow replacing 2.5 parts of corn on a w/w basis. The birds were slaughtered at 8 wk of age. Fatness scores of the gizzard and heart did not vary significantly with dietary tallow level. The 2 highest dietary tallow concn. gave higher fatness scores for the abdominal cavity than the lower tallow levels. The 4% tallow diet gave higher breast muscle fatness scores than the other diets. Effects of dietary tallow on leg muscle fatness varied irregularly. AJDW

117

[Extraction of staphylococcal enterotoxins from foods.] Versuche zur Extraktion von Staphylokokken-Enterotoxinen aus Lebensmitteln.

Sinell, H.-J.; Mentz, I.

Archiv für Lebensmittelhygiene 29 (4) 150-155 (1978) [many ref. De, en] [Inst. für Lebensmittelhygiene, Fleischhygiene & Tech., Freie Univ. Berlin, Koserstrasse 20 III, 1000 Berlin 33]

A procedure is described for purifying staphylococcal enterotoxins which omits column chromatography and its associated losses. The extracts are treated with trypsin, acid and chloroform. Model experiments showed recoveries of about 30% (vs. 10% after column chromatography); the losses were attributed mainly to chloroform precipitation. The sensitivity of the method, $5\ \mu\text{g}/100\ \text{g}$, is considerably lower than the $0.1\ \mu\text{g}/100\ \text{g}$ required. A negative result therefore does not ensure the safety of a food sample. Nevertheless use of this method in doubtful cases is recommended. In isolated *Staphylococcus* cultures toxin is easily and reliably determined by the dialysis culture technique. The detection of enterotoxin in 2 samples responsible for food poisoning, i.e. enterotoxin A in chicken soup, and toxins A and C in Bierschinken is reported. RM

118

[Microbiological quality of Spanish precooked frozen meat dishes. I. Indicator organisms.]Polo Villar, L. M.; Herrera Martache, A.; Pozo Lora, R.
Anales de Bromatologia 29 (1) 13-33 (1977) [44 ref. Es, en] [Univ. de Cordoba, Cordoba, Spain]

232 commercial samples of precooked frozen meat dishes were examined for total viable count (35°C), coliforms, *Escherichia coli* (MPN), enterococci (MPN), and the % frequencies of the various counts. Tabulated results showed that 78.7% of the samples had total counts $> 50\ 000/\text{g}$ (the Spanish legal standard), and 29.1% $> 30 \times 10^6$; 39.7% had > 1100 coliforms/g, 73.3% $< 10\ E. coli/\text{g}$, 48.3% < 100 enterococci/g. The most heavily contaminated foods were meat balls and chicken 'milanesa'. Realistic Spanish legal standards are proposed as follows: viable total count $< 100\ 000/\text{g}$, coliforms $< 100/\text{g}$, *E. coli* $< 10/\text{g}$ (MPN), and enterococci $< 1000/\text{g}$ (MPN). RM

119

[Microbiological quality of Spanish precooked frozen meat dishes. II. Pathogenic staphylococci, *Clostridium perfringens* and *Salmonella*.] Polo Villar, L. M.; Herrera Martache, A.; Pozo Lora, R. *Anales de Bromatologia* 29 (2) 135-147 (1977) [51 ref. Es, en] [Univ. de Cordoba, Cordoba, Spain]

232 commercial samples of precooked frozen meat dishes were examined for pathogenic staphylococci, *Clostridium perfringens* and presence of salmonellae. Tabulated results showed that 11.2% of samples contained pathogenic staphylococci; the most heavily contaminated dishes were chicken hamburgers and meat balls. 90.5% of samples contained < 10 Cl. *perfringens*/g, and only 3.9% > 100 /g. Salmonellae were present in 13.4% of all samples, and in 4 out of 5 samples of one brand. More stringent sanitary control is recommended, especially as regards detection of carriers. [See preceding abstr. for part I.] RM

120

Glutathione peroxidase of skeletal muscle. Lin, T.-S.; Hultin, H. O.

Journal of Food Biochemistry 2 (1) 39-47 (1978) [10 ref. En] [Dep. of Food Sci. & Nutr., Univ. of Massachusetts, Amherst, Massachusetts 01003, USA]

The isolation, partial purification and some properties of a soluble glutathione peroxidase from chicken skeletal muscle are reported. A leg muscle extract was purified by $(\text{NH}_4)_2\text{SO}_4$ fractionation, DEAE-Sephadex A-50 column chromatography and gel filtration on Sephadex G-150 (fine followed by superfine). About a $15 \times$ increase in specific activity was achieved. Mol. wt. of the enzyme was estimated to be 80 000. The pH optimum was 6.9, and the enzyme was inhibited by KCl at $\geq 0.15\text{M}$. K_m values for reduced glutathione (GSH) were 0.26mM and 0.36mM in the presence of 0.2mM H_2O_2 or 0.11mM linolenic acid hydroperoxide (LAH), resp. K_m values for H_2O_2 and LAH were 10 μM and 0.67mM, resp., over a range of GSH concn. The enzyme has a potential anti-oxidative role in meat [see also FSTA (1977) 9 6S1100]. DIH

121

[Effects of high Pb levels in the feed on the performance of and residue levels in broilers.] Einfluss höherer Bleidosierungen im Broilerfutter auf Leistung und Rückstände.

Nezel, K.; Vogt, H.

Archiv für Geflügelkunde 42 (6) 209-212 (1978) [6 ref. De, en, fr, ru] [Inst. für Kleintierzucht, Bundesforschungsanstalt für Landwirtschaft, Braunschweig-Völkenrode, Celle, Federal Republic of Germany]

671 one-day-old Lohmann broiler chicks were used in a 7-wk feeding trial to evaluate effects of diets with 0, 125, 250, 500, 1000, 2000 or 4000 p.p.m. Pb (as lead acetate) on performance, and on Pb concn. in the tissues. Tables and a graph of results are given. The results show tissue Pb concn. to increase with increasing dietary Pb concn. up to a saturation level, after which tissue Pb concn. did not increase with further increases in dietary Pb level. These saturation Pb levels were (p.p.m.) muscle 1; liver 6; kidney 12; bones > 1000 ; skin 6; and fat 3. AJDW

122

Hepatic and renal metallothionein concentrations in cows, swine, and chickens given cadmium and lead in feed.

Verma, M. P.; Sharma, R. P.; Street, J. C.

American Journal of Veterinary Research 39 (12) 1911-1915 (1978) [30 ref. En] [Dep. of Anim., Dairy & Vet. Sci., Utah State Univ., Logan, Utah 84322, USA]

This paper includes data for Cd concn. in the liver and kidney of cattle fed diets containing 0.18, 2.40 or 11.29 μg Cd/g for 12 wk, pigs fed diets with 0.23, 2.41 or 10.12 μg Cd/g for ≤ 24 wk, and laying hens fed diets containing 0.32, 1.88 or 13.06 μg Cd/g for ≤ 24 wk. Tissue Cd concn. in all 3 spp. increased with increasing dietary Cd level and treatment time. Max. values for Cd concn. in liver and kidney resp. were (μg Cd/g tissue, wet wt. basis): cows 3.21 and 8.83; pigs 10.29 and 42.26; and hens 26.27 and 165.67. Data are also given for metallothionein concn. in liver and kidney of cattle, pigs and hens fed diets with added Cd or Pb. AJDW

123

[Gentamycin in neonatal chickens.

Pharmacokinetics, distribution in tissues, residues and acute toxicity.]

Carli, S.; Calcaterra, C.; Sonzogni, O.; Pompa, G.; Brusa, T.

Clinica Veterinaria 101 (12) 876-881 (1978) [26 ref. It, en] [Istituto di Farmacologia & Tossicologia Vet., Univ. degli Studi, Milan, Italy]

160 Hubbard chicks were used in a study on residue levels in tissues after subcutaneous injection of gentamycin at a dose of 4 mg/kg body wt.; 80 chicks were treated (at 1 day of age); 80 were kept as untreated controls. Residue concn. were determined in serum, muscle, lungs, liver and kidneys at 1, 2, 3, 4, 5 and 6 wk of age. A table of results is given. No residues were detectable in serum, muscle or lungs, even only 1 wk after treatment. Liver samples 1 wk after treatment contained 0.094 μg gentamycin/g; no residues were detectable subsequently in liver tissue. Gentamycin residue concn. in kidneys decreased from 0.498 μg /g after 1 wk to 0 after 5 wk. AJDW

124

The action of crude papain on the myofibrillar proteins of chicken breast muscle.

Rattrie, N. W.

Dissertation Abstracts International, B 37 (10) 4968: Order No. 77-8378, 156pp. (1977) [En] [Cornell Univ., Ithaca, New York 14850, USA].

Myosin, actin, tropomyosin, troponin and α -actinin (plus various combinations of these myofibrillar proteins) from chicken breast muscle were subjected to controlled proteolysis with crude papain (1:125). Natural actomyosin and uncontracted and contracted myofibrils were similarly subjected to proteolysis. All substrates studied were hydrolysed to some degree within 3 min. Myosin was hydrolysed at both the globular end of the rod and the rod (hinge) site. Results for actin suggest that 2 actin populations exist. Tropomyosin was slightly hydrolysed and protected actin from hydrolysis in the actin-tropomyosin combination. α -actinin was relatively inert. Results with actin-myosin suggested that the myosin rod site was preferred while results with natural actomyosin

indicated a preference for the globular end. Myofibrils were extensively hydrolysed, contracted myofibrils being more rapidly hydrolysed. The rate of hydrolysis was greatest for actin. JA

125

Enzymic detoxified mustard seed meal (DMSM) as a substitute for vegetable and animal protein concentrates.

Shah, F. H.; Khan, A. D.; Niazi, A. H. K.; Gilani, A. H. *Pakistan Journal of Scientific and Industrial Research* 20 (3) 206-211 (1977) [30 ref. En] [PCSIR Lab., Lahore, Pakistan]

Three 8-wk experiments with day-old chicks showed that enzyme-detoxified mustard seed meal could replace 100% sesame seed meal, 66% of blood meal, and 33% of fish meal in poultry feed without a significant effect on dressing %. RM

126

[Determination of penicillin residues in chicken muscle by silica gel TLC.]

Moreno Garcia, B.; Diez Fernandez, V.; Calles Enriquez, A.

Anales de Bromatologia 29 (2) 127-134 (1977) [17 ref. Es, en] [Fac. de Vet., Leon, Spain]

A method is described for TLC detn. of penicillin residues in chicken muscle and separation of penicillin from tetracycline residues. In model mixtures the 2 antibiotics were well separated by an n-butanol:methanol:acetic acid:water (37.5:25:7.5:16) solvent system and detected by I_2 vapour at 0.4 IU, and $PtCl_2$ at 0.04 IU. The limit of detection in muscle extracts was 0.4 IU/g, which is much less sensitive than that with biological detection (agar diffusion), 0.0025 IU/g. RM

127

[Prepared dishes. Chicken fricassee with cultivated mushrooms.]

Bulgaria, D'rzhaven Komitet za Standartizatsiya *Bulgarian Standard* BDS 14380-77, 5pp. (1977) [Bg]

The prepared dish, produced form, shall contain 5-8% fat, 18-22% DM, 0.8-1.5% salt, and max. 10, 100 and 0.3 mg/kg Cu, Sn and Pb, resp.; there is no tolerance for pathogenic, anaerobic or non-sporeforming organisms or moulds. Shelf life is 2 yr at $\leq 15^\circ\text{C}$. HBr

128

A comparison of the lytic activity of poultry, human, and bovine phages with staphylococci of different origin.

Hajek, V.; Horak, V.

Zentralblatt für Bakteriologie, Parasitenkunde, Infektionskrankheiten und Hygiene, IA 242 (4) 446-455 (1978) [31 ref. En, de] [Dep. of Microbiol., School of Med., Palacky Univ., Olomouc, Czechoslovakia]

625 staphylococcal strains, of which 325 were *Staphylococcus aureus* (including chicken 100, swine 30, rabbit 15, cow 90, sheep 25 and hare 15), were typed using a set of 22 poultry phages used by Shimizu [see *American Journal of Veterinary Research* (1977) 38, 1389-1392]. For comparison, strains were also typed using 24 human and 12 bovine phages. 94.0% of the

chicken strains were lysed by poultry phages, 0-6.7% of other strains being lysed, at routine test dilution (RTD). At $100\times$ RTD, 60% of rabbit and 56.6% of cow strains were lysed by poultry phages. The results show a high degree of host-reaction-specificity; at RTD only 14.0% and 1.0% of chicken strains were lysed by human and bovine phages, resp. Tabulated data show frequencies of lytic reactions for each phages used. The set of poultry phages used provides an excellent means for typing chicken-derived staphylococci. DIH

129

Cross-contamination during the scalding and plucking of broilers.

Mulder, R. W. A. W.; Dorresteyn, L. W. J.; Broek, J. van der

British Poultry Science 19 (1) 61-70 (1978) [23 ref. En] [Processing Dep., Spelderholt Inst. for Poultry Res., Min. of Agric. & Fisheries, Beekbergen, Netherlands]

Experiments were carried out in 2 poultry slaughtering plants to estimate cross-contamination occurring during the scalding and plucking of broilers. To simulate the external (dust and feather) and internal (intestinal) contamination of broilers the carcasses were artificially contaminated with a strain of *Escherichia coli* K12. Cross-contamination occurred at both stages in the processing when the carcasses had been contaminated externally; when the broilers had been contaminated internally slight cross-contamination occurred only during plucking. Broilers which were contaminated externally before scalding resulted in more numerous carcasses that were contaminated after the whole slaughtering procedure than those contaminated internally. In one processing plant there were fewer contaminated carcasses after cooling than after plucking, while in the other plant no differences were found in the number of positive carcasses after these 2 stages in processing. AS

130

Skin blackening during the cooking of spent laying fowls.

Grey, T. C.; Robinson, D.; Davies, A. M. C.; Jones, J. M. *British Poultry Science* 19 (1) 71-75 (1978) [7 ref. En] [Food Res. Inst., Colney Lane, Norwich NR4 7UA, UK]

Blackening of the skin in factory processed cooked hens has been associated with elevated Cu levels. The degree of blackening was not directly related to Cu content although the latter level was always higher than in control hens. Simulated factory procedures, using scald water at 53°C or 60°C containing 50 mg Cu^{2+}/l . and 50 mg Cl_2/l ., produced blackened skins of varying intensity on cooking. It is suggested that the problem arose from a malfunction of the chlorination plant which produced excessive levels of Cl and low pH, followed by erosion of Cu from water pipes and subsequent interaction of Cu and Cl with the chicken skin. AS

131

[The feeding value of field peas as a protein substitute for soybean meal in broiler rations.]

Huyghebaert, G.; Groote, G. de; Moermans, R. J. *Revue de l'Agriculture* 31 (4) 675-686 (1978) [21 ref.

Fr, en][Chet. de Recherches Agron. de l'Etat a Gand, Burg-Van Gansberghelaan 92, B-9220 Merelbeke, Belgium]

In a 49-day trial, 1280 broiler chicks were fed diets of 0, 5, 10 and 20% raw, extruded, flaked, cold- and steam-pelleted field peas as an iso-N and iso-caloric substitute for soybean meal. Tabulated results show no significant effects of the level of pea meal or processing method on growth rate, mortality, or the flavour of broiler meat. RM

132

Effects of selected inorganic salts on certain tenderness characteristics of spent hen muscle.

Palladino, D. K.; Ball, H. R., Jr.

Journal of Food Science 44 (2) 322-326 (1979) [En] [Dep. of Food Sci., N. Carolina State Univ., Raleigh, N. Carolina 27650, USA]

The effects of 15 inorganic salts on the tenderness of spent hen muscle were examined. Addition of salts at in-muscle ionic strengths of $\mu = 0.125, 0.25$, and 0.50 equalized charges, enabling examination of specific ion effects. Criteria measured included water holding capacity, yield, moisture, and shear. Li^+ , Mg^{2+} and Na^+ salts were the most effective for increasing tenderness. Ca^{2+} salts decreased tenderness. Overall ranking for tenderizing effects of anions was $\text{Cl}^- > \text{Br}^- > \text{I}^- > \text{F}^-$, and for cations $\text{Li}^+ = \text{Na}^+ = \text{Mg}^{2+} > \text{K}^+ > \text{Ca}^{2+}$. There were no differences in tenderness among ionic strengths, $\mu = 0.25$ or 0.50 . Similar tenderness effects were observed at $\mu = 0.125$. Previously frozen samples were significantly affected by treatments, while non-frozen samples showed no effect due to treatment. IFT

133

Free amino acids in broiler chicken meat in relation to initial pH.

Niewiarowicz, A.; Pikul, J.; Trojan, M.; Thomson, J. E. *Poultry Science* 57 (5) 1468-1470 (1978) [7 ref. En] [Inst. of Anim. Products Tech., Agric. Acad. of Poznan, Poznan, Poland]

The content of 13 free amino acids in broiler breast meat was measured by an automatic amino acid analyser. Overall, free amino acid content of low pH (5.5 to 5.7) meat was significantly lower than that of intermediate pH (5.9 to 6.2) meat, which in turn was lower than that of high pH (6.4 to 6.6) meat. Overall free amino acid content was significantly lower in fresh meat than in meat stored for 6 days at 4°C . Of the amino acids studied, alanine, threonine and glutamic acid were present at high levels and methionine, phenylalanine, isoleucine, and proline at low levels. In fresh carcasses, the content of free amino acids was similar in meat at intermediate and high pH, but was significantly lower in meat at low pH. In stored carcasses, the content of free amino acids was similar in meat at low and intermediate pH and was significantly higher in meat at high pH. AS

134

Changes in the microbial flora of smoked chicken during storage.

Oblinger, J. L.; Koo, L. C.; Koburger, J. A.; Janky, D. M. *Poultry Science* 57 (1) 123-126 (1978) [7 ref. En] [Food

Sci. & Poult. Sci. Dep., Univ. of Florida, Gainesville, Florida 32611, USA]

Smoked broiler halves were stored at $25, 15$ or 5°C for ≤ 28 days. Samples were analysed for total aerobic plate counts, yeasts and moulds, coliforms, % salt and phenolic content. At 25°C , a mixed microbial flora was evident with visible mould growth. At 5 and 15°C , yeasts and moulds predominated. The major source of contamination was believed to be the sawdust. No coliforms were found in the smoked product regardless of storage temp. Salt penetration was rapid throughout chicken muscle whereas the major concn. of phenols was located on the skin. AS

135

Studies on abdominal fat with four commercial strains of male broiler chicken.

Griffiths, L.; Leeson, S.; Summers, J. D.

Poultry Science 57 (5) 1198-1203 (1978) [17 ref. En] [Dep. of Anim. & Poultry Sci., Univ. of Guelph, Guelph, Ontario, Canada]

Cockerels from 4 commercial broiler strain crosses were used to study strain differences in abdominal fat deposition. 90 birds of each strain were floor reared to 4 wk of age. At this age, 40 birds of each strain were transferred to individual cages; the remainder were used for carcass studies. Individual bird feed intake was measured to 8 wk of age, at which time all birds were killed for carcass and abdominal fat measurements. Strain differences were noted in abdominal fat, although variation between individuals was large (coeff. of variation 26%), leaving interpretation of such differences and their correlation with performance data open to question. When data were grouped from the extremes in ranking for abdominal fat, and expressed as a sub-sample mean effect, a significant difference in 8 wk body wt. was observed. Comparable groupings based on body wt. and feed conversion had no significant influence on abdominal fat. These results raise the question as to whether or not meaningful extremes within a population could provide the basis for a selection programme aimed at reducing abdominal fat pad size. AS

136

Broiler necks flumed in recycled bird chiller water.

Lillard, H. S.

Poultry Science 57 (1) 142-149 (1978) [6 ref. En] [Agric. Res. Service, USDA, Richard B. Russell Agric. Res. Cent., PO Box 5677, Athens, Georgia 30604, USA]

Faecal coliform levels and salmonellae incidence on necks were the same whether they were flumed in potable or bird chiller water; total aerobic counts were slightly lower for necks flumed in potable water. The majority of necks had a shelf-life of 12-16 days when flumed with either potable or chiller water, and the effluents had about the same microbial quality. BOD and COD in reused bird chiller water was equal to the combined BOD and COD load of chiller water and potable water used for fluming. AS

137

Sensory qualities of chicken broiler hearts and livers.

Tarver, F. R., Jr.; Ball, H. R., Jr.; May, K. N.

Poultry Science 57 (1) 119-122 (1978) [3 ref. En] [Food

Sci. Dep., N. Carolina State Univ., Raleigh, N. Carolina 27607, USA]

Trimmed and untrimmed chicken broiler hearts and livers were prepared as pate, packaged, and deep fat fried for sensory assessment. Triangle and preference tests data revealed a significant difference between heart pate and liver pate and a significant preference for liver pate and packaged raw trimmed hearts and livers. Panelists accepted equally trimmed and untrimmed hearts and livers prepared as pate and deep fat fried products. AS

138

Prevention of toughening of chicken breast muscle cut immediately after slaughter by control of pH decline.

Peterson, D. W.; Lilyblade, A. L.

Journal of Food Science 44 (3) 857-858 (1979) [En]

[Dep. of Avian Sci., Univ. of California, Davis, California 95616, USA]

The influence of slowing the rate of pH decline on the toughening effect of cutting chicken pectoralis muscle shortly after slaughter was studied by injection of $\text{NaHCO}_3/\text{Na}_2\text{CO}_3$ buffer into the muscle immediately after evisceration. Buffer injected to a calculated level of 0.48% solids resulted in cut muscles with an ultimate mean pH of 6.5, which were completely tender after 24 h ageing. Buffer injected at a calculated level of 0.72% solids resulted in muscles which were adequately tender after 5 h ageing and extremely tender (ultimate pH 6.7) after 24 h ageing. Untreated cut control muscles were relatively tough after 24 h ageing (ultimate pH 5.75-5.78). IFT

139

Shelf-life and quality characteristics of poultry parts dipped in potassium sorbate.

Cunningham, F. E.

Journal of Food Science 44 (3) 863-864 (1979) [En]

[Dep. of Anim. Sci. & Ind., Kansas State Univ., Manhattan, Kansas 66506, USA]

Fresh broiler parts were dipped 30 or 60 s in solutions of potassium sorbate. Drumsticks were stored at refrigerator temp. and evaluated daily for off-odour development and total counts. Thighs and breasts were baked to internal breast temp. of 85°C, cooled, then evaluated for shear press values, moisture retention, and sensory properties. Drumsticks dipped in potassium sorbate developed off-odours later than controls. Those parts dipped in 10% potassium sorbate had a 20-day shelf-life at 4°C, based on off-odour development and time for total counts to reach 10^7 . Parts dipped in potassium sorbate for 30 s, drained, then baked had similar Shear Press (tenderness) and Carver Press (moisture retention) values regardless of sorbate concn. used. Taste panel members could not distinguish between those parts dipped in 5 or 10% potassium sorbate and those parts dipped in distilled water. Sensory evaluations were significantly lower for those parts dipped in 15% potassium sorbate solutions for 1 min. Parts dipped in 5 or 10% solutions for 1 min were indistinguishable from controls. IFT

140

Retention and stability of volatile sulfur-containing compounds in chicken meat.

Farbood, M. I.; MacNeil, J. H.

Journal of Food Science 44 (3) 652-655 (1979) [En]

[Dep. of Food Sci., Pennsylvania State Univ., University Park, Pennsylvania, 16802, USA]

[^{35}S]methionine was used to generate radioactive volatile S-containing compounds. The degree of retention and stability of these compounds in a cold chicken meat slurry was determined. It was found that substantial amounts of radioactive volatile S-containing compounds were trapped in the slurry (0.71 μCi). It was also concluded that 44.0% of the total methanethiol generated was trapped in the slurry. Further investigation revealed that the major portion of these highly volatile S-containing compounds, which were trapped in the slurry, was no longer volatile and would not be released upon heating. Subsequent heating of the slurry for 4 h under reflux and in an open vessel resulted in a 32.3% and 33.8% loss of radioactivity, resp. However, the major loss of radioactivity occurred within the first h of cooking with little loss of activity after that period. The results of a chloroform-methanol fractionation showed that 90.7% of the trapped radioactive S-containing compounds were associated with the protein fraction of meat. The association of these compounds with the protein fraction was confirmed using picric acid precipitation. The remaining radioactive S-containing compounds retained in the aqueous and lipid fraction, 8.95% and 0.35% resp., could also play an important role in flavour. IFT

141

Characteristics of some radiation-resistant hemolytic micrococci isolated from chicken.

Welch, A. B.; Maxcy, R. B.

Journal of Food Science 44 (3) 673-675 (1979) [En]

[Dep. of Food Sci. & Tech., Univ. of Nebraska, Lincoln, Nebraska 68583, USA]

Radiation-resistant micrococci isolated from chicken were studied because of their haemolytic properties. Morphology, growth, and physiological characteristics were similar in most ways to the common micrococci. There were some differences in pigmentation, nitrate reduction, hydrolysis of proteins, and salt tolerance. None of these characteristics appeared to be uniquely linked to radiation resistance of micrococci. Present knowledge does not indicate these bacteria to be of public health significance or to pose an organoleptic problem in quality protection. IFT

142

Sodium nitrite and sorbic acid effects on *Clostridium botulinum* toxin formation in chicken frankfurter-type emulsions.

Sofos, J. N.; Busta, F. F.; Bhothipaksa, K.; Allen, C. E.

Journal of Food Science 44 (3) 668-672 (1979) [En]

[Dep. of Food Sci. & Nutr., Univ. of Minnesota, 1334 Eckles Avenue, St Paul, Minnesota 55108, USA]

C. botulinum growth and toxin production and residual nitrite depletion were studied in a mechanically deboned chicken meat (MDCM) frankfurter-type

product, during 27°C temp. abuse. A series of 3 trials was conducted in order to determine the effects of NaNO₂ and sorbic acid on the above parameters. Low nitrite concn. (20 and 40 µg/g), did not influence *C. botulinum* growth and toxin production. Addition of sorbic acid (0.2%) to these nitrite levels resulted in a significant extension of the time necessary for toxin to develop. The 0.1% sorbic acid level was ineffective. Nitrite concn. of 156 µg/g doubled the time necessary for botulinal toxin production, as did 0.2% sorbic acid alone. The magnitude of toxin production delay was increased 5 fold when 156 µg/g nitrite and 0.2% sorbic acid were combined. Nitrite depletion was rapid during processing and 27°C incubation. Low residual nitrite concn. were present for a longer time in nitrite-sorbic acid combination treatments, indicating that the presence of sorbic acid may delay depletion of residual nitrite. Gas production and spoilage of the product followed the same rate of development as toxin. IFT

143

Chicken broth concentrate.

Krasovec, B.; Mihelic, E.; Reutlinger, S. (HP Kolinska Ljubljana Prehrambena Industrija (n.sol.o.])
United States Patent 4 113 884 (1978) [En]

A process is described in which waste chicken broth heated to 50–55°C is combined with an aqueous suspension of an anti-gelling enzyme (papain), followed by the addition of an anti-foaming agent. The broth is then boiled for about 10 min to separate insoluble residues and fats, and to concentrate the broth. IFT

144

The effect of thiosemicarbazide administration on the tenderness of meat obtained from mature chickens and on some characteristics of its intramuscular collagen.

Sekoguchi, S.; Nakamura, R.; Sato, Y.
Poultry Science 57 (1) 104–110 (1978) [26 ref. En] [Lab. of Food Sci. & Tech. Anim. Products, Fac. of Agric., Nagoya Univ., Nagoya, Japan]

The effect of thiosemicarbazide (TSC) administration of the tenderness of meat from mature chickens was investigated. TSC-administered mature chickens were significantly more tender than controls, although body wt. of the administered chickens decreased during the period of feeding. Muscles from the TSC-administered birds contained more collagen than controls. Amount of acid soluble collagen and its aldehyde content were significantly increased by TSC administration. An extremely large difference was noted in thermal behaviour of acid soluble collagen between administered and control birds. Electron microscopic observation also showed a great difference between both groups of collagen. AS

145

The effect of brief microwave treatment on numbers of bacteria in fresh chicken patties.

Cunningham, F. E.
Poultry Science 57 (1) 296–297 (1978) [6 ref. En] [Dairy & Poultry Sci. Dep., Kansas State Univ., Manhattan, Kansas 66506, USA]

Fresh, raw chicken patties were exposed to microwaves for 0, 10, 20, or 40 s, then tested immediately for total count and coliforms. The work was repeated 4 times. Briefly exposing chicken patties to microwaves reduced their total count from 10⁴ to 6 × 10³ after 10 s, to 10³ after 20 s, and to nearly 10² after 40 s. The 40-s treatment had some effect on meat colour (partially cooked). Coliforms were less affected than was total count, the MPN dropped from 100/10 g in the untreated meat to 50/10 g after the meat had been exposed to microwaves for 40 s. It is suggested that microwaves might be used to pasteurize raw meat products without changing other quality characteristics of the meat. AS

146

The effect of salt concentration and brining time on organoleptic characteristics of smoked broiler hens.

Janky, D. M.; Oblinger, J. L.; Koburger, J. A.
Poultry Science 57 (1) 116–118 (1978) [5 ref. En] [Florida Agric. Exp. Sta., Univ. of Florida, Gainesville, Florida 32611, USA]

In each of 2 trials, 84 Cobb colour-sexed broiler breeder hens were slaughtered at 52 wk of age using standard techniques except for subscald and overnight chilling (1°C). After 4 wk frozen storage, 12 birds were randomly assigned to each of 7 treatments, a control, and a 2 × 3 factorial arrangement of 2 brining times (16 and 32 h) and 3 brine concn. (2.5, 5.0 and 7.5% NaCl). The treated birds were slow-cooked with smoke. Both light and dark meat samples were evaluated for flavour, juiciness and tenderness by a taste panel. In addition, these samples were subjected to shear force analysis. As the salt concn. was increased, the panelists scored dark meat significantly higher for flavour, regardless of brining time. Light meat which had been brined for 16 h was also scored significantly more juicy as the salt concn. was increased. There were no significant differences observed for tenderness, juiciness or flavour for any other combinations of taste panel scores. It appeared, however, that increasing the salt concn. improved scores numerically. Shear force analysis indicated that meat from birds brined at 7.5% salt for 16 or 32 h or 5.0% salt concn. for 32 h was significantly more tender than the meat from unbrined birds. Generally, all treatments appeared to increase tenderness of the meat. AS

147

Ascorbic acid dipping as a means of extending shelf life and improving microbial quality of cut-up broiler parts.

Arafa, A. S.; Chen, T. C.
Poultry Science 57 (1) 99–103 (1978) [10 ref. En] [Mississippi Agric. & Forestry Exp. Sta., Poultry Sci. Dep., Mississippi State Univ., Mississippi 39762, USA]

Dipping cut-up broiler parts in 1% ascorbic acid solution for 3 min retarded microbial growth and increased refrigerated shelf-life for 6 to 7 days when compared with water-dipped controls. Throughout the entire storage period, ascorbic acid-dipped samples had lower microbial counts and coliform MPN than water-dipped controls. Dipping in ascorbic acid had no adverse effect on organoleptic characteristics of the

cooked meat. Additional studies employing phosphoric and hydrochloric acid solutions at pH 2.75 indicated that pH reduction was not the only factor responsible for the microbial reduction observed when broiler parts were dipped in 1% ascorbic acid solution. AS

148

Microbiological aspects of polyphosphate injection in the processing and chill storage of poultry.

Mead, G. C.; Adams, B. W.

Journal of Hygiene 82 (1) 133-142 (1979) [16 ref. En] [Food Res. Inst., Colney Lane, Norwich NR4 7UA, UK]

During commercial processing of broiler chickens, injection of polyphosphate (Puron 604 or 6040) resulted in microorganisms being added to the deep breast muscle. The level of contamination was related to the microbiological condition of the injection solution. Injection of polyphosphate had no effect on the shelf-life of fresh chilled carcasses held at 1° or 10°C but changes were observed in the growth rate of microorganisms in the deep muscle and in the composition of the muscle microflora following storage. Cross-contamination of carcasses and the transfer of organisms from the skin to the deep muscle during injection was demonstrated with a marker strain of *Clostridium perfringens*. However, both processes were influenced by the number of marker organisms applied initially to the skin. The above findings are discussed in relation to the possible behaviour of any food poisoning bacteria present. AS

149

High-resolution gas chromatographic profiles of volatile organic compounds produced by microorganisms at refrigerated temperatures.

Lee, M. L.; Smith, D. L.; Freeman, L. R.

Applied and Environmental Microbiology 37 (1) 85-90 (1979) [17 ref. En] [Dep. of Chem., Brigham Young Univ., Provo, Utah 84602, USA]

3 different strains of bacteria isolated from spoiled, uncooked chicken were grown in pure culture on Trypticase soy agar supplemented with yeast extract. The volatile organic compounds produced by each culture were concentrated on a porous polymer precolumn and analysed by high-resolution gas chromatographic MS. 20 different compounds were identified. Both qualitative and quantitative differences in the chromatographic profiles from each culture were found. AS

150

Effects of sulprofos and its sulfoxide and sulfone metabolites on laying hens fed the compounds in the diet.

Clark, D. E.; Ivie, G. W.; Crookshank, H. R.;

DeVaney, J. A.; Bull, D. L.

Journal of Agricultural and Food Chemistry 27 (1) 103-107 (1979) [8 ref. En] [Vet. Toxicology & Entomology Res. Lab., USDA, College Station, Texas 77840, USA]

The organophosphorus insecticide sulprofos O-ethyl O-[4-(methylthio)phenyl] S-propyl phosphorodithioate, Bolstar, BAY NTN 9306 and its sulfoxide and

sulphone were fed as a mixture (20/50/30, resp.) to White Leghorn laying hens at 5, 15, 50 and 150 p.p.m. (of mixture) in the diet. Residue levels in giblets, muscle, fat and eggs remained below the limit of detection (<0.05 p.p.m.) during the 28 days of the study, except for samples of fat from birds fed the highest level, which contained 0.22 p.p.m. DIH

151

Effects of processing and cooking on PBB residues.

Zabik, M. E.; Johnson, T. M.; Smith, S.

Environmental Health Perspectives 23, 37-41 (1978) [20 ref. En] [Dep. of Food Sci. & Nutr., Michigan State Univ., E. Lansing, Michigan 48824, USA]

To study the effect of processing on polybrominated biphenyl (PBB) levels, milk from 4 dairy herds containing <0.3 p.p.m. (fat basis) of physiologically incorporated PBBs was processed individually into cream, skim-milk, butter and stirred curd cheese. Pasteurized and freeze-dried whole milk, skim-milk, and cream, spray-dried whole milk and skim-milk, and condensed whole milk were also made. PBBs were concentrated in the high-fat products. Spray-drying reduced PBBs in whole milk and skim-milk while pasteurization, freeze-drying, ageing of cheese and condensation were not effective. To study the effect of cooking on PBB levels, thigh meat, thigh skin, drumstick and breast (with skin) from half of chickens fed PBBs were analysed raw, and pieces from the other halves were analysed following separate pressure cooking. The level of PBBs expressed as p.p.m. on a solids basis was lower in the cooked sample than in the corresponding raw piece and part of the PBBs lost were found in the drip. Recoveries of PBBs in cooked tissue and broth ranged from 68.1% in the thigh skin to 84.6% in the drumstick, with approximately two-thirds of the recovered PBBs found in the cooked meat itself. Therefore, pressure cooking resulted in a loss ranging from 36% for the drumstick to 53% for the thigh skin. AS

152

The New South Wales chicken meat industry.

Slennett, G. D.

Agricultural Gazette of New South Wales 89 (5) 28-30 (1978) [En]

The growth of the chicken meat industry in New South Wales since it commenced in 1958/1959 is reviewed. Future prospects of the industry include expansion of the market, but at a slower rate than previously. SP

153

[Ante-mortem pH of skin surface as an index to post-mortem PSE and DFD in the breast muscle of broilers.] pH-Wert der Hautoberfläche vor der Schlachtung als Indikator für PSE- und DFD-Fleisch bei Broilern.

Niewiarowicz, A.; Pikul, J.

Fleischwirtschaft 59 (3) 405-407 (1979) [14 ref. De, en] [Akad. Rolnicza, Wojska Polskiego-Strasse 31, 60-624 Poznan, Poland]

Significant correlations ($r = 0.73$ at $p = 0.05$) were found in broilers between pH on the surface of breast

smooth skin ante-mortem and pH in the breast muscle post-mortem. The pH, measured 15 min after slaughter was found in earlier studies to be a criterion for broiler carcass classification into PSE (pale, soft, exudative), normal and DFD (dark, firm, dry) meat. Using this relationship it is suggested that detn. of pH on the skin of broilers ante-mortem may be used as a quick and cheap test for predicting meat quality. AS

154

[The effect of transport on poultry. I. Effect of transport time on meat quality in male and female broilers.] Transporteinflüsse auf Schlachtgeflügel. I. Einfluss verschiedener Transportzeiten auf die Fleischqualität von männlichen und weiblichen Broilern.

Ehninger, F.; Gschwindt, B.

Fleischwirtschaft 59 (2) 234-236 (1979) [many ref. De, en] [Univ. Hohenheim, Postfach 106, D-7000 Stuttgart 70, Federal Republic of Germany]

In a 2-factor experiment (transport time and sex), 84 broilers were transported for 0, 1, 2, 3, 4, 5 or 6 h and the effects on pH in the thigh, roasting loss, tenderness, water binding capacity and loosely bound water (press test) in breast and thigh muscle determined. Tabulated results showed that water binding capacity and loosely bound water were worst after 4 and 3 h transport resp., and tenderness of breast after 4 h transport; female birds had higher roasting losses from both breast and thigh and higher pH in the thigh than males. No significant interactions between the quality criteria were observed except for that of water binding capacity in the thigh with loosely bound water in the breast. RM

155

[The effect of transport on poultry. II. The influence of transport time on the physiological characteristics of male and female broilers.] Transporteinflüsse auf Schlachtgeflügel. II. Einfluss verschiedener Transportzeiten auf physiologische Merkmale von männlichen und weiblichen Broilern.

Gschwindt, B.; Ehninger, F.

Fleischwirtschaft 59 (3) 401-404 (1979) [many ref. De, en] [Univ. Hohenheim, Postfach 106, D-7000 Stuttgart 70, Federal Republic of Germany]

The effects of transport time and sex on the following physiological characteristics were studied: liver glycogen, blood sugar, serum lipid, cholesterol and protein, blood haemoglobin and haematocrit value. Results, shown graphically and in tables, were subjected to statistical analysis, including correlations with meat quality parameters. Significant effects of transport time were observed for liver glycogen, blood sugar, serum lipid, protein and haemoglobin value; significant effects of sex were observed for blood sugar, liver glycogen, and haematocrit value. Correlations were observed for liver glycogen with pH, and for juiciness of thigh with tenderness and water binding capacity of breast meat. RM

156

Development of antimicrobial agents for the extension of poultry shelf-life.

Islam, M. N.; Gray, R. J. H.; Geiser, J. N.

Poultry Science 57 (5) 1266-1271 (1978) [17 ref. En] [Dep. of Food Sci. & Human Nutr., Univ. of Delaware, Newark, Delaware 19711, USA]

53 chemicals were evaluated for their antimicrobial activity around neutral pH against 5 predominant cultures isolated from spoiled poultry and 3 reference organisms. 11 of these chemicals were found to be effective in the desired pH range of 6.5-7.5. 2 of the 11 chemicals, iodoacetamide and chloroacetamide, were found to inhibit the growth of spoilage organisms at concn. of 30 and 80 p.p.m. resp. Freshly processed broilers were immersed in solutions of these 2 chemicals, drained, packed in polyethylene bags, and held at 5°C until spoilage ensued. Birds treated with solutions of iodoacetamide and chloroacetamide at 5000 p.p.m. were found to have average shelf-lives of about 11 and 10 days resp., compared to a shelf-life of 7.5 days for the control samples. AS

157

Metabolism of atrazine by the soluble fraction (105000g) from chicken liver homogenates.

Foster, T. S.; Khan, S. U.; Akhtar, M. H.

Journal of Agricultural and Food Chemistry 27 (2) 300-302 (1979) [10 ref. En] [Anim. Res. Inst., Res. Branch, Agric. Canada, Ottawa, Ontario K1A 0C6, Canada]

The soluble fraction (105 000 g_n) from chicken liver homogenates contains a heat-labile, glutathione-dependent enzyme(s) which metabolizes atrazine in vitro incubations. This is accomplished by conjugation with glutathione and subsequent hydrolysis and partial N-dealkylation to the hydroxy and dealkylated analogues. Evidence is also presented for some dechlorination of the chloro-s-triazine to hydroxy-s-triazine. However, enzymic hydrolysis of atrazine is the predominant reaction in the soluble fraction from chicken liver homogenates. AS

158

The effect of stocking density on the performance of broilers.

Guneshver Rao, S.; Siddiqui, S. M.; Mathur, C. R.; Reddy, C. V.

Indian Veterinary Journal 54 (1) 50-54 (1977) [11 ref. En] [Coll. of Vet. Sci., AP Agric. Univ., Hyderabad, India]

250 commercial broiler chicks were used in a 10-wk study on effects of floor space (0.5, 0.75, 1.0, 1.25 or 1.5 ft²/bird) on performance and carcass quality. Feed and water were supplied ad lib. Tables of results are given, including data for dressed, eviscerated, giblet and ready-to-cook yields, expressed as wt. and %. No statistically significant differences in carcass yields attributable to floor space allowance were observed; significant differences between males and females were, however, observed. AJDW

159

[Abstracts of papers presented at the 2nd Annual Meeting of the Chilean Society of Animal Production.] [Conference proceedings] Chile, Chilean Society of Animal Production *Ciencia e Investigacion Agraria* 5 (4) 233-248 (1978) [Es]

Abstracts of 49 papers presented at the Catholic University of Chile, Santiago, in July 1977 include the following of food interest: Feeding broilers on high levels of fatty acids from safflower and fish oils. Effects on carcass yield, composition and storage, by M. Camiruaga, J. de la Vega, L. Masson & S. Burdiles (p. 233); Effect of machine milking, refrigeration and storage on bacteriological quality of milk, by A. Hargreaves, C. Pedraza & J. J. Romero (p. 235); Effects of subclinical mastitis on milk quality, by C. Pedraza, J. Garcia, C. Ciudad, R. Palma, G. Alegria & L. Zurita (p. 235); and Live wt. as an estimate of carcass and carcass part yields in Hampshire Down lambs (p. 242). SKK

160

[Technology of application of textured vegetable proteins in the production of ready-to-eat meals.] Turubatovic, L.; Modic, P.; Bastic, L.; Polic, M. *Tehnologija Mesa* 19 (12) 351-353 (1978) [7 ref. Sh, en] [Jugoslovenski Inst. za Tehnologiju Mesa, Belgrade, Yugoslavia]

Utilization of textured soy proteins (TSP) in ready-to-eat meals (usually containing coarse pieces of meat) is presented. The basic material comprised a nutritionally and technologically optimal ratio of 70% ground meat and 30% rehydrated TSP (type "N", Kolinska Co. Ljubljana) plus additives and other ingredients, giving a protein efficiency ratio higher than that of FAO reference casein or plain meat. A brief description is given of ready-to-eat meals, including hamburgers and cabbage, and chicken meat balls and string beans. The products were filled into 400 g tins and sterilized at 118°C for 60 min. The organoleptic, culinary and nutritive qualities were very favourable, the TSP being indistinguishable from the meat components with no soy off-flavour recognizable. Savings amount to 4.7-8.5% when TSP is used in these products. Further improvements in the technology of ready-to-eat meals are predicted. STI

161

A comparison of the fluorescent antibody method and a standardized cultural method for the detection of salmonellas.

Gibbs, P. A.; Patterson, J. T.; Early, J. *Journal of Applied Bacteriology* 46 (3) 501-505 (1979) [16 ref. En] [Agric. & Food Bact. Res. Div., Dep. of Agric. for N. Ireland, Newforge Lane, Belfast BT9 5PX, UK]

Results of routine use of the indirect fluorescent antibody (FA) technique using the Spicer-Edwards H antisera set are reported for a range of agricultural and food samples [including chicken carcasses and meat products]. The FA technique was used on samples after the pre-enrichment incubation period in the proposed ISO method for isolation of salmonellas. Numbers of

FA false positive samples (approx. 5% overall) and FA false negative samples (approx. 1.3%) were low, but some originally FA false positive results were later shown to be false negative cultural results. AS

162

Dynamic and steady shear rate aspects of minced meat 'setting'.

Nakayama, T.; Haugen, P. *Journal of Texture Studies* 8 (1) 81-92 (1977) [11 ref. En] [Fac. of Fisheries, Mie Univ., Tsu, Japan]

Dynamic and time-dependent steady shear rate properties of minced chicken meat were studied immediately after preparation and following a 24 h low temp. incubation. Incubation at 3°C resulted in a significant increase in the storage moduli and a relatively constant decrease in the loss tangent over the range of strain amplitude (0.010-0.126) at an angular frequency of 0.299/s. The stress relaxation behaviour was retarded and the equilibrium shear stress value was 30% higher when compared with the untreated samples. Time-dependent studies of hysteresis loop areas revealed a significant increase in structure breakdown after incubation. The effects observed after low temp. incubation were ascribed to an intermolecular interaction between myosin A and F-actin. AS

163

Attachment of certain bacterial strains to chicken and beef meat.

Firstenberg-Eden, R.; Notermans, S.; Schothorst, M. van *Journal of Food Safety* 1 (3) 217-228 (1978) [12 ref. En] [Lab. of Food Microbiol. & Hygiene, Agri. Univ., Wageningen, Netherlands]

The attachment of bacteria to chicken and beef meat with and without fascia was studied. It was found that bacteria attach readily to the meat surfaces. The kinetics of attachment depend on the bacterial strain, as well as on the meat surface. Of the bacteria tested which included *Escherichia coli* K12, *Klebsiella* sp., *Pseudomonas* EBT/2/143, *Salmonella typhimurium*, *Salm. infantis* and *Staphylococcus aureus*, *Pseudomonas* EBT/2/143 attached most readily to all meat surfaces examined. Chicken breast with fascia was the best surface for attachment. A study was also made of the effects of storage on the multiplication of the attached bacteria and the feasibility of removing them. A high level of *Salm. infantis* was found in comparison to the other bacteria after 24 h of storage at 20° C. After micro-colonies began to form, the newly generated bacteria were easy to remove. The hygienic consequence of this phenomenon is discussed. AS

164

[Drip loss, hygienic status and frequency of salmonellae in products made from chicken breast muscle.] Dripverlust, hygienischer Status und Salmonellenhäufigkeit bei Erzeugnissen aus Hühnerbrustmuskulatur.

Siems, H.; Hildebrandt, G. *Fleischwirtschaft* 58 (11) 1825-1828, 1831-1834, 1837; 1819 (1978) [71 ref. De, en] [Inst. für

Lebensmittelhygiene, Fleischhygiene & -Tech., Freie Univ. Berlin, 1000 Berlin 33]

185 ready-to-cook chicken breast products (natural, in batter or shaped) from Berlin stores and shops were examined for composition, drip loss and bacterial contamination. The 117 breast fillets had a drip loss (4° C, 40 h) of 11.0–19.0%, the thaw water containing ≤8% native tissue fluid. An average drip loss of 14% by wt. would be regarded as the upper limit for normal commercial quality. A product falls below this standard if an individual pack exceeds the critical value $C = 20\%$ drip fluid, or the mean of 20 samples exceeds $C = 16.1\%$. For forensic purposes drip detn. is not sufficient to provide a reliable estimate of extraneous water. The liquid absorbed can be calculated from: extraneous water (g) = total water (g) - 3 × fat-free DM (g) [see Woltersdorf, FSTA (1972) 4 8S1057]. Analytical results from 68 samples of breast products suggest limits of ≤35% by wt. moist batter with ≥40% DM. Bacteriological examination showed much higher contamination than in whole broiler carcasses. Enterobacteriaceae, enterococci and Pseudomonadaceae were regularly detected at 10^4 – 10^5 /g or ml drip fluid, and there were unexpectedly high counts of yeasts (≤ 10^5 /ml drip fluid). Salmonellae were found in 39 of 132 samples examined. A test plan based on 10 packs is proposed, with the whole batch rejected when there were >3 salmonella-positive samples. [From En summ.] RM

165

The role of the myofibrillar proteins of chicken breast muscle in the formation of meat emulsions. Galluzzo, S. J.

Dissertation Abstracts International, B 38 (7) 3111: Order no. 77-28350, 212pp. (1978) [En] [Cornell Univ., Ithaca, New York 14850, USA]

The role of myofibrillar protein fractions (myosin, actin, synthetic actomyosin, synthetic regulated actomyosin, natural actomyosin), and contracted and uncontracted glycerinated myofibrils in protein/oil/water emulsion formation was studied; effects of ATP and pyrophosphate were also investigated. Emulsifying capacity, and protein removal from the aqueous phase, were evaluated. Myosin had the highest emulsifying capacity, and the highest % protein removal from the aqueous phase; actin had the poorest emulsifying capacity and lowest % protein removal from the aqueous phase. Myosin was rapidly removed from solution and formed fine, thick emulsions; actin was not readily removed from solution, and formed thin coarse emulsions, the globule size of which increased during emulsification. When present as actomyosin, actin and myosin were removed from solution in a manner similar to myosin alone; if this complex was dissociated by ATP or pyrophosphate, actin and myosin behaved independently. Troponin and tropomyosin were removed from the aqueous phase to a greater extent than actin but to a lesser extent than myosin or actomyosin. Effects of ionic strength, pH, protein concn., and rev/min of the mixer during emulsion preparation on the emulsifying characteristics of myosin are also considered. AJDW

166

[Changes produced in white muscle of hens by technological factors.]

Rassadkina, E. A.

Izvestiya Vysshikh Uchebnykh Zavedenii, Pishchevaya Tekhnologiya No. 6, 57–59 (1978) [3 ref. Ru] [Voronezhskii Tekh. Inst., Voronezh, USSR]

Typical changes in hen muscle tissue were established, which take place due to temp. and mechanical factors (steaming at 328–330°K for 90 s, mechanical plucking, cooling in water at 275–279°K for 20 min). Temp., combined with mechanical processing, results in chemical reactions substantially changing the composition and properties of white muscle of hens. Fast cooling of the poultry in ice-cold water increases extractability of myofibrillar proteins of the muscle tissue, increases water binding capacity and juiciness, and improves consumer appeal. STI

167

Considerations for the use of cassava as the energy source in broiler rations fed in tropical and subtropical regions.

Thomas, W. G.

Dissertation Abstracts International, B 38 (10) 4555–4556: Order no. 78-04174, 171pp. (1978) [En] [Univ. of Illinois, Urbana, Illinois 61801, USA]

Laboratory and field feeding trials were conducted to evaluate the feasibility of use of cassava meal as the energy source in broiler diets, with groundnut meal and fish meal as protein sources. Extensive data are given for effects of various diets containing peeled and non-peeled cassava root meal on performance and feed efficiency. Skin colour and fat deposition in broilers fed cassava-based diets were different from those of broilers fed corn-based diets; these differences did not, however, adversely affect consumer acceptance of the broilers. AJDW

168

[Control of fishy taint in broiler chickens. III. Effects of choline, methionine and vegetable oil supplements in the finisher ration on carcass flavour and fatty acid compositions of carcass and liver fats.]

Wessels, J. P. H.; Preez, J. J. du; Atkinson, A.; Langridge, V. G.

Agroanimalia 10 (4) 41–48 (1978) [12 ref. Af, en, fr] [Visnywerheidnavorsingsinst., Rondebosch 7700, South Africa]

Studies on the effects of added choline chloride (1.5 g/kg), DL-methionine (1.0 g/kg) and vegetable oil (3%) in finishing diets containing 0, 12 or 17% fish meal on the flavour and the carcass and liver fatty acid composition of broilers are described. The experimental diets were fed for 2 or 3 wk before slaughter. Data are also given for commercially-produced broilers fed diets with 0–10% fish meal and 0, 1 or 2 g choline chloride/kg feed for 17 or 24 days before slaughter. Tables of results are given. Addition of vegetable oil or choline chloride to the diet significantly improved flavour scores of the broilers; addition of methionine gave only slight

improvements in flavour. Effects of the dietary supplements tested on fatty acid compositions of carcass and liver fat are discussed, with special reference to concn. of C22:6, C20:4, C20:5, C16:0 and C18:2 fatty acids. All the factors studied influenced fatty acid compositions, the effects of added methionine being less than those of the other factors. Possible mechanisms of these effects are briefly considered [See FSTA (1979) 11 4S686 for part II.] AJDW

169

Technical note: A study of the hydrolysis of polyphosphate additives in chicken flesh during frozen storage by ^{31}P -FTNMR spectroscopy.

Douglass, M.; McDonald, M. P.; O'Neill, I. K.; Osner, R. C.; Richards, C. P.

Journal of Food Technology 14 (2) 193-197 (1979) [12 ref. En] [Sheffield City Polytech., Pond Street, Sheffield S1 1WB, UK]

Samples of pectoralis major muscle were cut from frozen chickens, macerated in disodium EDTA solution to prevent hydrolysis of polyphosphate while thawing, and thawed suspensions were analysed for phosphate content by ^{31}P -Fourier transform NMR. No signals were detected from the naturally occurring phosphates ATP or creatine phosphate. Chickens that had received a standard commercial polyphosphate injection prior to freezing and untreated controls were compared. The % of added polyphosphate hydrolysed was, after 5 months of frozen storage 0-4% (+ 1 sample 40%); after 15 months 9-32%; and after 43 months 66-100%. Variation in results is attributed to localization of injected solution prior to thawing. A consistent trend for hydrolysis of added polyphosphate with storage (at -20°C) was identified. DIH

170

Experiments in determining extraneous water contents in slaughter poultry.

Scholtyssek, S.; Ehninger, F.; Augstein, E.
Fleischwirtschaft 59 (5) 382-386 (1979) [En] [Univ. Hohenheim, Postfach 106, 7000 Stuttgart 70, Federal Republic of Germany]

Water uptake was determined in 1680 broilers from slaughterhouses at 20-40 min flow time through a counter-current dip chiller, followed by 1, 2 and 3 min drip time. In-plant and drip losses and extraneous water contents were determined in 2 laboratories by the Simonsen and Woltersdorf chemical methods [EEC regulation no. 2967/76] in oven-ready (with giblets) and ready-to-grill (without giblets) carcasses. Results are given in tables and diagrams (in accordance with EEC regulations appendices I to IV, as in-plant, drip, extraneous water S and extraneous water W, with correlations between the 2 methods). The following points emerged from evaluation of the data; for accurate results, water uptake in the slaughterhouse should be checked regularly (Appendix I); the drip method (Appendix II) gives reliable results which correlate well with in-plant values; sources of error in the 2 chemical methods (Appendix III and IV) are very large: the methods are not described precisely, do not have the required close relationship to in-plant values,

and give significantly different results in tests on the same material in different laboratories. They cannot be recommended. RM

171

Carcass composition of broilers on maize and sorghum diets at various levels of energy and protein in summer months.

Saxena, V. P.; Pradham, K.

Haryana Agricultural University Journal of Research 8 (4) 282-290 (1978) [19 ref. En] [Dep. of Anim. Nutr., Haryana Agric. Univ., Hissar, India]

Effects of 4 dietary protein levels, (i) 17-2, (ii) 19-22, (iii) 21-24 and (iv) 23-26%, and 2 metabolizable energy:protein ratios, (v) 130:1-155:1 and (vi) 145:1-170:1, using 2 grain types, (sorghum or maize) fed to day old commercial broilers (Indian River Strain) over a period of 0-6 or 0-10 wk, on chemical composition of carcasses were evaluated. Results are tabulated and show moisture contents were lower and fat contents higher in carcasses of maize fed groups over 0-6 wk; over 0-10 wk period the reverse was true for sorghum fed groups. (v) caused lower carcass fat values and (vi) resulted in lower carcass moisture %. Higher carcass protein values were recorded for maize diets than sorghum diets. (i)-(vi) had no effect on carcass % protein. Similar values were recorded for carcass ash % for all diets irrespective of overall growth period. SP

172

Influence of microorganisms on the carbonyl compounds of chicken tissue.

Moerck, K. E.

Dissertation Abstracts International, B 38 (7) 3112: Order no. 77-29671, 138pp. (1978) [En] [N. Carolina State Univ., Raleigh, N. Carolina 27607, USA]

Samples of chicken adipose tissue or thigh muscle were inoculated with bacteria or yeasts commonly associated with poultry meat, and stored for 3 days at 22°C or 7 days at 4°C ; carbonyl compounds were then determined. Acetone was the only monocarbonyl in fresh samples; concn. of various aliphatic monocarbonyls increased in stored samples. Of non-inoculated samples, more oxidation occurred in ground thigh muscle than in ground adipose tissue. Effects of the various microorganisms studied (*Candida lipolytica*, *Rhodotorula aurantiaca*, *Achromobacter lipolytica*, *Pseudomonas fluorescens*, *Ps. fragi*, *Ps. aeruginosa*, *Ps. aurantiaca*, *Ps. fairmontensis*, *Ps. syncyanea*, *Trichosporon pullulans* and *Micrococcus* sp.) on peroxide and carbonyl compound concn. in the stored samples are discussed in detail. AJDW

173

[Changes in composition of fatty acids in chicken meat in relation to quality of fatty ingredients in the feed.]

Savran, E. G.; Kuznetsova, V. V.; Gorizontova, M. G.; Bashkireva, E. M.

Trudy, Vsesoyuznyi Nauchno-issledovatel'skii Institut Myasnoi Promyshlennosti 20, 46-50 (1976) [12 ref. Ru]

The possibility of increasing the level of unsaturated fatty acids in chicken meat lipids was tested by feeding

chickens with rations containing the basic allowance + various fat-containing admixtures. The level of fatty acids in chicken meat increased only with high fat additions (10% of fat), when the lipids content of tested birds increased by 0.5% compared with the control chickens. The composition of fatty acids in the lipids differed, particularly the contents of palmitic, palmitoleic and arachidic acids, Sunflower seed oil scum proved to be a suitable supplement to feeding rations and compared well with technical fat. The application of a combination of the above fats resulted in high levels of oleic, linoleic and arachidic acids in chicken meat lipids. STI

174

[Changes in the contents of organochlorine pesticide residues in canned chicken meat in relation to sterilization conditions and degree of comminution.] Zhukova, L. A.; Peretolchin, V. V.; Shumkova, I. A. *Trudy, Vsesoyuznyi Nauchno-issledovatel'skii Institut Myasnoi Promyshlennosti* 20, 76-80 (1976) [8 ref. Ru]

Canned chicken in natural juice and canned minced chicken meat were used in the experiments. The meat:fat ratio in all samples was 9:1; the sterilization was carried out in a stationary autoclave with 20-35-20-120°C sequence and 0.15-0.18 mN/m² pressure or in a rotary autoclave at 5-35-15-125°C or 7-20-10-130°C and 0.15-0.18 mN/m² pressure. GC was used for qualitative detn. of pesticides and column chromatography on silica gel ASK with hexane-benzene (1:1) as elution agent for quantitative detn. Organochlorine pesticides were more readily broken down in cans containing the more finely comminuted product. Pesticides in canned chicken in natural juice were more completely decomposed when the rotary autoclave was used, but sterilization conditions did not affect the pesticide changes in finely comminuted meat. STI

175

Effect of dietary fat level on lipid metabolism in growing chicks.

Tanaka, K.; Kitahara, K.; Shigeno, K. *Japanese Journal of Zootechnical Science [Nihon Chikusan Gakkai-ho]* 50 (2) 100-107 (1979) [29 ref. En, ja] [Fac. of Agric., Gifu Univ., Kakamigahara-shi, 504, Japan]

Groups of male White Leghorn chicks were reared identically up to 4 wk of age; they were then subdivided into 4 groups, receiving diets containing 0, 5, 10 or 15% fat. After 3 wk on the experimental diets, the birds were slaughtered, and the liver wt., abdominal fat wt., and triglyceride, total cholesterol and phospholipid concn. in the liver were determined. The results show that liver wt., abdominal fat wt. and liver cholesterol and triglyceride concn. decreased significantly with increasing dietary fat level; liver phospholipid concn. was not significantly influenced by dietary fat level. AJDW

176

Types of bacteria and shelf-life of evacuated carbon dioxide-injected and ice-packed broilers.

Bailey, J. S.; Reagan, J. O.; Carpenter, J. A.; Schuler, G. A.; Thomson, J. E. *Journal of Food Protection* 42 (3) 218-221 (1979) [32 ref. En] [Food Sci. Dep., Univ. of Georgia, Athens, Georgia 30602, USA]

Broiler carcasses were packed in low-permeability film bags that were evacuated, injected with CO₂, then held at 2°C. Broilers were examined microbiologically and for off-odour to determine shelf-life and types of bacteria. Vacuum level did not significantly affect bacterial counts. Broilers stored in 65% CO₂ had 1-day longer shelf-life than those held in 20% CO₂ and about a 5-day longer shelf-life than ice-packed broilers. Spoiled carcasses from either 20 or 65% CO₂ packages had an acid-sour off-odour, and >90% of bacteria present were *Lactobacillus*. Ice-packed broilers had the typical putrid off-odour at spoilage, and >95% of bacteria were non-pigmented *Pseudomonas*. AS

177

[*Staphylococcus aureus* in slaughter poultry. Biochemical characteristics, antibiotic resistance and phage pattern.] *Staphylococcus aureus* beim Schlachtgeflügel - biochemische Eigenschaften, Antibiotikaresistenz und Lysisspektrum. Hentschel, S.; Kusch, D.; Sinell, H.-J. *Zentralblatt für Bakteriologie, Parasitenkunde, Infektionskrankheiten und Hygiene, IB* 168 (5/6) 546-561 (1979) [60 ref. De, en] [Inst. für Lebensmittelhygiene, Fleischhygiene & -Techn., Freie Univ., Berlin]

Studies on the incidence and characteristics of *Staphylococcus aureus* at a poultry slaughterhouse are described. Of swabs from broiler carcasses, 35.3% were *Staph. aureus* positive; the swabs from feathers and skin had a higher incidence of *Staph. aureus* (47.4%) than swabs from the cloaca or the throat (incidence 19.0% and 23.3%, resp.). 49.2% of swab samples from processing personnel were *Staph. aureus* positive; 56.6% of swab samples from hands or gloves and 41.8% of samples from aprons were *Staph. aureus* positive. Incidence of *Staph. aureus* in individual batches of broilers (from different farms) ranged from 8.1 to 62.9%. Incidence of *Staph. aureus* increased during slaughter, and was not related to time of yr. Only 34% of isolates from poultry and 20% of isolates from personnel were antibiotic resistant (resistance to tetracycline predominating among poultry isolates, penicillin resistance predominating among personnel isolates). Biochemical and phage patterns of the isolates are discussed. Only 2.5% of isolates from broilers showed characteristics described in the literature as 'poultry-specific', whereas 24% of broiler isolates and 37% of personnel isolates were 'human-specific'. It is concluded that a high proportion of the *Staph. aureus* originated from slaughterhouse personnel. AJDW

178

[Effect of heat treatment on contents of residual chlortetracycline and tetracycline in various tissues of the hen.]

Shakaryan, G. A.; Akopyan, Z. M.; Sevyan, T. K. *Voprosy Pitaniya* No. 2, 74-75 (1979) [17 ref. Ru] [Erevanskii Zoovet. Inst., Erevan, USSR]

In 1 series of experiments, (i) 6 hens received by mouth 100 mg chlortetracycline (CC)/kg body wt. and (ii) 6 received similarly 100 mg tetracycline (TC); in a 2nd series of experiments, (iii) 6 hens received similarly 100 mg CC + 20 mg Ftazin sulphonamide, and (iv) 6 hens received 100 mg TC + 50 mg Ftazin. (i) - (iv) were slaughtered 2 h after drug administration and contents of CC and TC were determined in muscles, gizzard and liver when fresh, and after boiling for 20, 30 and 60 min., contents in broth also being determined. It is concluded from results tabulated in detail that residual TC was fully destroyed in the muscles and broth by boiling for 30-60 min, but that some CC still persisted; that traces of TC and CC persisted in the gizzard; and that presence of the sulphonamide did not exert any protective effect. SKK

179

Radiation-induced changes in the patterns of free ninhydrin-reactive substances of meat.

Partmann, W.; Keskin, S.

Zeitschrift für Lebensmittel-Untersuchung und -Forschung 168 (5) 389-393 (1979) [19 ref. En] [Federal Res. Cent. for Nutr., Engesser Strasse 20, D-7500 Karlsruhe 1, Federal Republic of Germany]

Studies on changes in amino acids in longissimus dorsi muscle of cattle and swine, breast muscle of chickens and white lateral body muscle of carp as a result of 10-MeV electron irradiation are described. All samples were packaged in polyethylene/Hostaphan bags before irradiation. Beef was irradiated at 0.5-20 Mrad; the other samples only at 10 Mrad. Tables of data are given for free ninhydrin-reactive substances (amino acids) in the irradiated beef samples. Irradiation at ≤ 5 Mrad did not significantly influence amino acid levels, except that an unidentified compound (eluted immediately after lysine during column chromatography and giving a distinctive yellow band above carnosine in high-voltage electrophoresis) was formed. At higher irradiation doses, small but significant losses of anserine and carnosine were observed, together with formation of higher levels of the unidentified compound. This substance was also present in irradiated pork and chicken, the level in chicken being appreciably higher than in beef or pork. A different unidentified component was detected in irradiated carp; it eluted in place of methylamine, and gave a brownish-red band above β -alanine in high-voltage electrophoresis. AJDW

180

[Effects of the time of storage before thawing and after re-freezing on broiler meat quality.]

Auswirkungen der Lagerdauer vor dem Auftauen und nach erneutem Einfrieren auf die Fleischbeschaffenheit von Broilern.

Ristic, M.; Schön, L.

Fleischwirtschaft 59 (1) 91-93 (1979) [6 ref. De, en] [Bundesanstalt für Fleischforschung, 8650 Kulmbach, Federal Republic of Germany]

560 frozen whole broiler carcasses stored for 0-3 months or 6-11 months at $\leq -18^\circ\text{C}$ were thawed under controlled conditions (38 h at $+4^\circ\text{C}$), cut at room temp. (16°C), and breast and leg joints packaged in soft PVC film, refrozen at -38°C and stored for ≤ 4 months at -12° or -18°C . Samples were examined monthly for pH, rigor, freezer burn, smell, colour (visually), fat characteristics (peroxide and aldehyde values) and sensory criteria (using a semantic numerical interval scale of 6 to 1). Results and analysis of variance are tabulated. Sensory analysis showed deterioration in the quality of leg meat ≤ 3 months, and of breast meat ≤ 4 months after refreezing. The effect of all the parameters on total variance was 27.04% for breast, 53.57% for leg. Storage temp. had no significant effect. Fat characteristics deteriorated 2 months after refreezing. The total shelf-life for frozen poultry thus becomes 6-7 months for short-term, and 12-14 months for long-term storage. RM

181

Formation of monocarbonyl compounds in chicken tissue.

Moerck, K. E.; Ball, H. R., Jr.

Journal of Agricultural and Food Chemistry 27 (3) 514-519 (1979) [37 ref. En] [Dep. of Food Sci. N. Carolina State Univ., Raleigh, N. Carolina 27650, USA]

Broiler adipose and thigh muscle tissue samples were aseptically obtained, ground, and then stored for 3 days at 22°C or 7 days at 4°C . Hexane-extracted carbonyl compounds were converted to their 2,4-dinitrophenylhydrazone derivatives and identified. Acetone was the only monocarbonyl present in fresh tissue samples. There was an increase in the concn. of all classes of aliphatic monocarbonyl compounds in stored tissue samples. More oxidation occurred in stored ground thigh muscle than in stored ground adipose tissue samples. 2-Pentanone was the only methyl ketone formed during storage. C2-C10 alkanals were present in all stored samples. Hexanal and acetaldehyde were present in the highest concn. C6-C11 2-alkenals were isolated from ground thigh muscle samples and C7-C10 2-alkenals were identified in adipose tissue samples. 2-Nonenal was the predominant 2-alkenal in all samples. 2,4-Alkadienals were composed primarily of heptadienal, nonadienal, and decadienal, with decadienal being the predominant 2,4-alkadienal in all samples. AS

182

Cross-contamination during the preparation of frozen chickens in the kitchen.

Wit, J. C. de; Broekhuizen, G.; Kampelmacher, E. H. *Journal of Hygiene* 83 (1) 27-32 (1979) [13 ref. En] [Lab. for Food Microbiol. & Hygiene, Agric. Univ., Wageningen, Netherlands]

A study was made of the extent of which frozen broilers, contaminated with indicator organisms, can cause cross-contamination in the kitchen. In 60 kitchens a number of relevant objects were sampled during the

preparation of contaminated frozen broilers. Results show that cross-contamination occurred in a high proportion of the kitchens examined. In many instances the indicator organism was still present on various objects even after rinsing, 'clearing' or washing up. In view of the possible risk of a cross-contamination with *Salmonella* spp. the importance of instructing food preparers is emphasized. No salmonellas could be found in the sinks of the 60 kitchens examined. AS

183

[Effect of addition of spices on the flavour of chicken.]

Polic, M.; Nedeljkovic, L.

Tehnologija Mesa 19 (12) 359-362 (1978) [6 ref. Sh, en]
[Jugoslovenski Inst. za Tehnologiju Mesa, Belgrade, Yugoslavia]

The effect of the addition of 15 different spices to a mixture of equal parts of ground white and dark poultry meat was tested organoleptically after pasteurization (90 min at 80°C) and sterilization (35 min at 116°C) to determine which spices are compatible or incompatible with hens meat. The results obtained will serve as a basis for the formulation of specific spice mixtures for various poultry meat products. According to the tests the spices fall into three groups: compatible spices (black pepper, nutmeg, garlic, marjoram, parsley, celery, oregano, curry, and rosemary); neutral spices with no effect on the flavour of poultry meat (red pepper, coriander, caraway and allspice); and unacceptable spices causing an off-taste (thyme and basil). The spices of the neutral group should be further tested in various combinations with those of the compatible group to arrive at improved spice mixtures. STI

184

[Effect of cooling and of freezing in liquid nitrogen on the surface microflora of chicken carcasses.]

Eljasiak, J.; Knaut, T.; Pogorzelska, E.; Uradzinski, J.
Medycyna Weterynaryjna 34 (3) 182-184 (1978) [6 ref. Pl]
[Inst. Hodowli i Tech. Produkcji Zwierzecej, AR-T, Olsztyn, Poland]

Batches of 60 chicken carcasses from poultry factories were cooled in ice-water or in liquid N₂ vapour and examined directly; batches of 90 carcasses cooled in the same ways or not cooled were frozen in an air tunnel at -35°C, or frozen in a liquid N₂ tunnel at -115°C to -130°C. All batches were then stored at -19° to -21°C and examined after storage for 1 wk and 6 months, total aerobic bacteria and psychrotrophic bacteria counts and coliform and enterococci titres being determined on surface swabs taken from the frontal region by a standardized technique. It is concluded from results tabulated in detail that cooling in liquid N₂ vapour had a favourable effect in reducing the general level of contamination; that neither freezing method had an effect on total contamination; that contamination decreased in frozen storage; and that reduction in initial contamination with psychrotrophic microorganisms is desirable from the viewpoint of quality preservation in prolonged frozen storage. SKK

185

Volumetric method for determining traces of organic chlorine in lipids.

Cunningham, H. M.; Lawrence, G. L.

Journal of the Association of Official Analytical Chemists 62 (3) 482-484 (1979) [5 ref. En] [Health & Welfare Canada, Food Directorate, Tunney's Pasture, Ottawa, Ontario, Canada K1A 0L2]

The official AOAC method for determining Cl in cake flour lipids was modified to determine Cl in lipids of animal carcasses cooled with chlorinated water. The sensitivity of the method was improved 1000-fold to attain a detection limit of 2 p.p.m. Cl in lipids. Recovery of the fine AgCl precipitate was improved through centrifugation rather than filtration. The official method also did not take into consideration that when the AgCl precipitate is exposed to light, it is converted to free Cl and Ag. Recovery of organic Cl ranged from 84.6% at 4.1 p.p.m. to 100.1% at 100 p.p.m. A number of samples of commercially chlorinated beef, pork, and chicken and laboratory-chlorinated chicken were analysed by this method. In all cases where the level of chlorination was sufficient to result in a Cl level in lipids in excess of 2 p.p.m., the Cl content of the carcass lipids was measurable. AS

186

Antibiotic resistance of *Salmonellae* in Czechoslovakia - situation and prospects.

Stepankova, E.; Janouskova, J.; Grunt, J.; Krcmery, V.; Havlik, J.

Zentralblatt für Bakteriologie, Parasitenkunde, Infektionskrankheiten und Hygiene, IA 243 (4) 450-456 (1979) [10 ref. En, de] [District Public Health Lab., Nitra, Czechoslovakia]

Studies of incidence of antibiotic-resistant strains of salmonellae in humans, farm animals and meat carried out in Czechoslovakia are discussed and evaluated. Of 482 strains of salmonellae isolated from meat, meat products and slaughter houses, 81 were resistant to 1 or more antibiotics, and 6 of these carried R-plasmids (i.e. had transferable resistance); 3 resistant strains were isolated from frozen chicken (from a total of 100 strains), and all 3 carried R-plasmids. Since 75% of resistant strains isolated from humans carried R-plasmids it is concluded that salmonella strains causing disease in humans acquire R factors in the gut from *Escherichia coli*, rather than in the food chain. DIH

187

Effect of electrical stunning on postmortem biochemical changes and tenderness in broiler breast muscle.

Lee, Y. B.; Hargus, G. L.; Webb, J. E.; Rickansrud, D. A.; Hagberg, E. C.

Journal of Food Science 44 (4) 1121-1122 (1979) [16 ref. En] [Campbell Inst. for Food Res., Campbell Place, Camden, New Jersey 08101, USA]

200 broilers were commercially processed with and without electrical stunning to determine the effect of stunning on biochemical changes and its relationship to

final meat tenderness. Electrically stunned birds were more tender with 30% lower shear values than no-stun controls after 24 h ageing. Breast muscles of electrically stunned birds showed significantly higher ATP, creatine phosphate and pH, and lower lactate level than no-stun controls during the early processing steps. It was concluded that electrical stunning inhibited the rapid breakdown of ATP, creatine phosphate and glycogen, and thus delayed the onset of rigor until after spin-chill by which time muscle temp. reached 4°C. Consequently, the rigor process occurred at low temp. where potential heat shortening was avoided, resulting in improved meat tenderness. IFT

188

[Minimization of fishy off-flavour in broiler carcasses.]

Wessels, J. P. H.; Preez, J. J. du; Atkinson, A.
South African Food Review 6 (2) 41, 45 (1979) [8 ref. Af]

Studies on the effects of diets containing $\leq 20\%$ fish meal, with or without addition of 0.287% DL-methionine, 1 g choline chloride/kg, 2% crude corn oil, or corn oil + methionine or choline, on the incidence of 'fishy' off-flavour in broiler carcasses are described; effects on fatty acid composition of carcass fat were also investigated. Tables of results are given. The results show that fish meal adversely affected flavour score of the carcasses. Corn oil + methionine or choline considerably reduced fishy off-flavour; corn oil alone had a similar effect; methionine or choline alone had less effect, results varying between trials. Groundnut and cottonseed oils had similar effects to corn oil. Dietary vegetable oils significantly influenced the fatty acid composition of the carcass fat, but choline and methionine had little effect on the fatty acid composition. AJDW

189

[Analytical data for pate samples.]

Schiavello, A.; Perlasca, M.; Macheda, A.
Industria Alimentari 18 (2) 125-126 (1979) [It, en]
[Istituto di Ispezione degli Alimenti di Origine Anim., Univ. di Milano, Milan, Italy]

This paper includes data for the chemical composition of samples of (i) liver pate, (ii) liver + meat pate, (iii) rabbit or hare meat pate, (iv) chicken pate and (v) ham pate. Ranges of values (10 samples of each pate type) were, for (i)-(v) resp.: moisture 38.9-62.8, 38.2-40.4, 49.7-51.4, 58.8-60.4 and 47.2-52.4%; protein 9.6-13.6, 9.2-13.8, 11.8-12.0, 10.6-11.8 and 10.5-12.3%; fat 28.4-46.3, 45.6-48.8, 31.4-32.0, 25.4-30.6 and 31.8-36.7%; ash 1.8-2.6, 1.4-1.6, 1.13-1.6, 1.4-2.1 and 1.8-2.3%; P_2O_5 0.269-0.444, 0.108-0.130, 0.108-0.120, 0.20-0.25 and 0.35-0.38%; Ca 11.2-15.6, 16.8-21.3, 15.4-25.4, 12-15 and 12.4-14.0 mg %; Mg 10.9-14.5, 13.8-14.3, 15.7-18.3, 17-18 and 17.8-18.1 mg %; and Fe 11.8-24.2, 17.8-64.2, 12.6-17.6, 39-44 and 42-44 mg %. Cu was present only at trace concn.; added polyphosphates were detected only in (i) and (v) samples. Data are also given for the moisture, protein and P concn. in beef, pork and chicken liver. AJDW

190

Yields of deep-fat fried chicken parts as affected by preparation, frying conditions and shortening.

Yang, C. S.; Chen, T. C.
Journal of Food Science 44 (4) 1074-1076, 1092 (1979) [13 ref. En] [MAFES, Poultry Sci. Dep., Mississippi State Univ., Mississippi 39762, USA]

8-piece-cut broiler parts from 2-2.5 lb carcasses were obtained from a processing plant. Parts were either battered and breaded or flour predusted, battered and floured again before being fried in a deep-fat fryer. At the doneness point (180°F min. internal temp.), the cooking yields of fried chicken decreased with an increase in frying temp. Overcooking reduced the yields. Wing parts had higher cooking yields than thigh, breast, and drumsticks. Fried chicken prepared with the flour predust-batter flour method had higher yields than that prepared with the batter-breading method. A slightly higher yield was observed for parts fried in solid shortening than for those fried in liquid shortening. Under the same holding temp., the wt. loss of fried chicken parts, held under heat lamps, was greater than those held in an electric oven. IFT

191

Spoilage association of chicken skin.

Daud, H. B.; McMeekin, T. A.; Thomas, C. J.
Applied and Environmental Microbiology 37 (3) 399-401 (1979) [14 ref. En] [Dep. of Agric. Sci., Univ. of Tasmania, Hobart, Tasmania 7001, Australia]

The bacterial succession on skin of broiler chicken carcasses stored at 2°C was traced, and the ability of representative isolates to produce off-odours was determined by using sterile leg and breast muscle sections. Off-odours were identified by olfactory and chemical means. The inability of peptone-iron agar to detect many sulphide-producing strains was noted. AS

192

Some physiological, chemical and physical characteristics of poultry and its meat as affected by adrenaline injection.

Abou-Hussein, E. M. R.; Alam, A.; Al-Salman, M. H.
Mesopotamia Journal of Agriculture 13 (2) 29-43 (1978) [18 ref. En, ar] [Dep. of Anim. Production, Coll. of Agric. & Forestry, Mosul Univ., Hammam Al-Alil, Mosul, Iraq]

2 breeds (Babcock and New Hampshire) of birds aged 1½-2 yr were used to study the effect of adrenalin injected intramuscularly at a rate of 1 mg/kg body wt. 1 h before slaughter on the physical and chemical properties of meat as well as on the physiological characteristics of the birds. All the treated birds showed a gradual and highly significant ($P < 0.01$) decrease in temp. The pH of red and white muscles of Babcock birds, measured 48, 96 and 144 h after slaughter, showed significant increases with time, a change which may have led to the observed increase in tenderness of the meat. No differences were observed in the chemical composition (protein, fat, ash and moisture) of meat from treated and control groups. Thus injection of adrenalin before slaughter may be useful for meat tenderization. AL

193

The effect of feed containing Cycostat on the taste of broiler chickens.

Klinger, I.; Basker, D.

Refuah Veterinarith 34 (1) 21-24 (1977) [9 ref. En]

[Kimron Vet. Inst., Bet-Dagan, Israel]

Chickens were fed a diet containing 33 p.p.m. of the anticoccidial agent Cycostat (1,3-bis-p-chlorobenzylideneamino-guanidine hydrochloride) from birth until slaughter; control chickens received the same diet without Cycostat. In trial I, legs and breast meat obtained from 7-wk old chickens immediately after slaughter were cooked for 20 min at 15 lb/in² with water and salt. In trial II, chickens slaughtered at 9 wk and stored frozen for 3 wk were used; the quartered carcasses were lightly dusted with a mild spice mixture and roasted for 45 min at 200°C. Trial III, performed at the same time as trial II, involved preparation of a consomme from male chickens by boiling for 60 min in 2 l. water containing salt and seasoning. Samples from all 3 trials were organoleptically evaluated by the triangle method. Comparison of Cycostat-treated and control chickens indicated a significant difference only in breast meat flavour; no difference was found in the flavour of leg meat. The taste panels did not find the flavour of treated chicken objectionable and in one case treated chicken was marginally preferred to untreated chicken. JA

194

[Composition of the edible part of frozen poultry - broilers.] Die Zusammensetzung des essbaren Anteils von gefrorenem Schlachtgeflügel - Brathähnchen.

Langner, H. J.; Berner, H. O.

Fleischwirtschaft 59 (1) 94-96 (1979) [7 ref. De, en]

[Inst. für Lebensmittelhygiene, Fleischhygiene & Tech., Freie Univ. Berlin, Koserstrasse 20, 1000 Berlin 33]

The following (tabulated) results were obtained from analysis of 50 broilers (mean frozen wt. 1000 g): fat 12-20% (45 samples), mean 15.7; protein 15-18% (41 samples), mean 16.84; extraneous water (factor F = 3.5) 0-10.7% (42 samples), mean 7.75; factor 4, 0 to -7% (38 samples); factor 3.5 combined with fat-free DM -1 to 8% (45 samples), mean extraneous water 4.79; and calories 158-238 cal/100 g edible portion (42 samples), mean 215. The following limits are recommended: fat ≤ 20%; protein ≥ 15%; and extraneous water ≤ 11% (factor 3.5), < 1% (factor 4), (factor 3.5 combined with fat-free DM ≤ 8%, obtained without protein detn.). Calorie values of 100/100 g edible portion, as declared on some commercial packages, are unrealistic. RM

TURKEYS

1

Effect of soy protein isolate on turkey rolls made from pre- and post-rigor muscle.

Kardouche, M. B.; Pratt, D. E.; Stadelman, W. J. *Journal of Food Science* 43 (3) 882-884 (1978) [28 ref. En] [Food Sci. Inst., Purdue Univ., W. Lafayette, Indiana 47907, USA]

4 levels (0, 1, 2 and 3%) of a soy protein isolate (Supro 620) were used with both pre- and post-rigor pectoralis muscles of turkeys. Water (3 × the wt. of the isolate) was added. Quality of rolls was determined by a sensory panel and shear values obtained from a Kramer shear cell attached to an Instron. As the level of isolate increased, the flavour, tenderness, texture and acceptability scores increased, and the shear values decreased. Level of protein isolate had a greater influence on the shear values than the rigor state of the meat. IFT

2

Flavor compounds related to the warmed-over flavor of turkey.

Ruenger, E. L.; Reiñeccius, G. A.; Thompson, D. R. *Journal of Food Science* 43 (4) 1198-1200 (1978) [9 ref. En] [Dep. of Environmental Health & Safety, Univ. of Minnesota, Minneapolis, Minnesota 55455, USA]

Taste panel results indicated that the warmed-over flavour of turkey meat was readily detectable and was equally detectable in both white and dark meat. Statistical analysis of gas chromatographic flavour profiles comparing fresh and reheated turkey meat selected 3 components of the profile as being correlated to the warmed-over flavour. The 3 components were found to increase due to reheating. 2 of the 3 were identified as heptanal and n-nona-3,6-dienal. The remaining compound could not be identified. The 2 known compounds are typical end-products of lipid oxidation which further supports the hypothesis that warmed-over flavour is due to lipid oxidation. IFT

3

Components of vitamin B₆ in turkey breast muscle.

Bowers, J. A.; Craig, J. *Journal of Food Science* 43 (5) 1619, 1621 (1978) [8 ref. En] [Dep. of Foods & Nutr., Kansas State Univ. Manhattan, Kansas 66506, USA]

Extracts of raw and cooked turkey breast muscle were chromatographically separated into pyridoxine, pyridoxal, and pyridoxamine fractions. These fractions, in addition to an extract for total vitamin B₆, were assayed microbiologically. Pyridoxine and pyridoxal contents were higher in the raw than in the cooked muscle; the pyridoxamine level was higher in the cooked muscle. No significant differences were found in the sum of the 3 forms of vitamin B₆ or total vitamin B₆ between cooked and raw muscle. IFT

4

The effect of preslaughter temperature, stress, struggle and anesthetization on color and textural characteristics of turkey muscle.

Froning, G. W.; Babji, A. S.; Mather, F. B. *Poultry Science* 57 (3) 630-633 (1978) [19 ref. En] [Dep. Anim. Sci., Univ. of Nebraska, Lincoln, Nebraska 68583, USA]

40 tom turkeys at 24 wk of age were equally randomized into the following 4 treatments: heat stress at 42° C for 1 h prior to slaughter; cold stress in ice water immersion for 20 min at 4° C prior to slaughter; anaesthetization with sodium pentobarbital at a dose of 0.143 grains/lb live wt. just prior to slaughter; and birds were allowed to struggle freely during slaughter. All birds were slaughtered using the subscald method (59° C) and chilled overnight prior to freezing at -29° C. Carcasses were packaged in PVDC film, and measurements were made after storage at -29° C for 3 months. Cold stressed and anaesthetized turkeys showed little struggle during bleeding, whereas free struggle and heat stressed birds exhibited considerable struggle. The free struggle birds were noted to have a lower muscle pH than that observed in the other treatments. Shear values of the pectoralis muscle was significantly higher in heat stressed and free struggle birds. There was a significant increase in Gardner L and a decrease in Gardner a_L colour values of white meat as struggle was minimized in the cold stress and anaesthetized treatments. These results indicate that preslaughter stress and struggle may affect the colour and textural characteristics of turkey meat. AS

5

Physical and chemical composition of meat loaves containing mechanically deboned turkey meat.

Uebersax, M. A.; Dawson, L. E.; Uebersax, K. L. *Poultry Science* 57 (3) 660-669 (1978) [31 ref. En] [Dep. Food Sci. & Human Nutr., Michigan State Univ., E. Lansing, Michigan 48824, USA]

Compositional, physical, and storage stability characteristics were evaluated for turkey loaves formulated with chunked breast meat in which either 0, 10, 20 or 30% mechanically deboned turkey meat (MDTM) was substituted (wt./wt.). Physical and compositional evaluations of whole turkey loaves included proximate composition (pH, moisture, fat, protein, ash, Ca), mineral analysis (P, Na, Ca, Mg, Mn, Fe, Cu, Zn), cook yields, and loaf dimensions. Cross-cut slices were evaluated for surface colour and texture. Compositional changes generally reflected ingredient blends. Cook yield and loaf size were improved with increased levels of MDTM. Slice surface colour (Hunter Lab) was darker and redder with increasing MDTM. Slices possessed less binding strength and were more tender with increased MDTM, as evaluated by slice breaking (binding strength) and by slice shearing (tenderness) using an Instron Press. Storage stability of formulated loaves was evaluated by the 2-thiobarbituric acid (TBA) test and sensory analyses. Raw and precooked foil wrapped and vacuum sealed MDTM substituted loaves were stored at -18° C for 6 months

prior to analyses. TBA numbers increased with increased level of MDTM and precooking and were lower with vacuum packaging. Sensory evaluations indicated increased moistness and more tender loaves with increasing levels of MDTM. Cooking and packaging treatments were distinguished using the triangle test for 10% MDTM substitution. Loaves incorporating up to 30% MDTM were of high quality after 6 months frozen storage. AS

6

Storage stability (TBA) and colour of MDCM and MDTM processed with CO₂ cooling.

Uebersax, K. L.; Dawson, L. E.; Uebersax, M. A. *Poultry Science* 57 (3) 670-675 (1978) [11 ref. En] [Dep. Food Sci. & Human Nutr., Michigan State Univ., E. Lansing, Michigan 48824, USA]

Mechanically deboned chicken meat (MDCM) and mechanically deboned turkey meat (MDTM) were processed using a commercial deboning system. Meat samples were obtained directly out of the deboning screen after passing through the CO₂ cooling chamber with CO₂ turned off, and after CO₂ cooling. Replicate lots were obtained and packaged in air and under vacuum and stored at -18° C for ≤3 months prior to 2-thiobarbituric acid (TBA) and Hunter Lab colour analyses. TBA numbers increased with storage time and with CO₂ cooling for both meats. Highest TBA numbers were obtained for CO₂ cooled meat stored for 3 months. Hunter Lab colour values varied with mixing treatment and storage time. Generally Hunter L (darkness) and +a₁ values (redness) decreased with storage time. Meat mixed without CO₂ cooling was lighter in colour than meat from either of the other treatments. Procedures used to chill mechanically deboned poultry meat should not be modified, however, based on these data alone, because CO₂ cooling does have definite microbiological advantages. [See also preceding abstr.] AS

7

Effect of rigor state, phosphate addition and aging on quality of turkey rolls.

Kardouche, M. B.; Stadelman, W. J. *Poultry Science* 57 (2) 425-432 (1978) [38 ref. En] [Dep. Anim. Sci., Purdue Univ., W. Lafayette, Indiana 47907, USA]

Light and dark turkey rolls were made with pre- and post-rigor meat that was mixed for variable lengths of time (10 and 30 min), with 2 levels of polyphosphate (Kena, O and 0.45%), stuffed into casings and frozen immediately. Rolls were thawed for 12 h at room temp. and steam cooked to an internal temp. of 76° C. Quality was evaluated by an 8 member semitrained panel and by obtaining shear values with a Kramer shear press attached to an Instron. Mixing for 30 min and phosphate addition improved cooked yields and sensory panel scores. Post-rigor meat had lower shear values than pre-rigor meat but mixing lowered the shear values such that pre-rigor meat that was mixed for 30 min had shear values not significantly different from post-rigor meat mixed for 30 min. The panel could not detect any differences between pre- and post-rigor samples. In the 2nd study, rolls were made from conventionally chilled meat, pre-rigor deboned meat

chilled for 1, 2, or 3 days, or from pre-rigor meat with prepared rolls being aged for 1, 2, or 3 days in a cooler at 3.3° C. Rolls made from pre-rigor deboned meat and aged for 3 days had the highest cooked yields; rolls made from pre-rigor meat aged for 3 days had the lowest shear values. The degree of tenderness of rolls made from conventionally chilled carcasses was comparable to that of the 3 day ageing period. The sensory panel could not detect any differences due to treatments. AS

8

Lactose-fermenting *Salmonella indiana* from turkeys in Britain.

Hall, M. L. M.; Threlfall, E. J.; Rowe, B.; Pinegar, J. A.; Gibson, G. L. *Lancet* 2 (8101) 1197-1198 (1978) [En] [Div. of Enteric Path., Cent. Public Health Lab., London NW9 5HT, UK]

A lactose positive strain of *Salmonella indiana* was isolated on several occasions from turkey offal at a processing plant. The strain grows overnight on MacConkey agar and lactose colonies are produced, whereas growth on bismuth sulphite agar shows typical salmonella-like colonies. Apart from the ability to ferment lactose, the strain has the typical biochemical reactions of a *Salmonella* of subgenus I. The lactose positive property of the *S. indiana* reported is non-transmissible either directly or by mobilization, and the property remains after acridine-curing experiments. Agarose-gel electrophoresis failed to reveal any plasmid DNA. It is concluded that laboratories relying solely on MacConkey agar and deoxycholate citrate agar for salmonella-isolation will not recognise this strain as *Salmonella*, and the use of bismuth sulphite agar is recommended. SP

9

Carnosine and anserine content of turkey breast and leg muscles.

Davies, A. M. C.; Wilkinson, C. C. L.; Jones, J. M. *British Poultry Science* 19 (1) 101-103 (1978) [8 ref. En] [Food Res. Inst., Colney Lane, Norwich NR4 7UA, UK]

Breast and leg muscles of 3 female turkeys were analysed for the dipeptides carnosine and anserine, on a Beckman 120 C amino acid analyser using a 180 × 9 mm column of Zeo-Karb 225 ion-exchange resin. The dipeptide levels of both breast and leg muscles showed a wide bird to bird variation. The most obvious variation was between the 2 types of muscle. Average results (g/100 g) of carnosine and anserine resp. were: breast, 0.24, 0.86; and leg, 0.026, 0.17. Breast muscle contained on average 10.9 times more carnosine and 5.1 times more anserine than leg muscle. VJG

10

Meat yield in turkeys.

Clayton, G. A.; Nixey, C.; Monaghan, G. *British Poultry Science* 19 (6) 755-763 (1978) [6 ref. En] [Dep. of Genetics, Univ. of Edinburgh, EH9 3JN, UK]

Live-weight and carcass components of 3 strains of commercial turkeys were compared; males were

slaughtered at fortnightly intervals from 12 to 24 wk of age and females from 12 to 18 wk. Age, live-weight and sex had major effects but, once these factors had been allowed for, little or no residual variation in the carcass components remained. For this reason the question is posed whether conformation per se has a major effect on yield. AS

11

[Package for roast fowl.]

Mercier, R.-J.

French Patent Application 2 375 109 (1978) [Fr]

A package designed particularly for roast turkey consists of a boat shaped trough made of food-grade injection-moulded polypropylene fluted at the bottom and reinforced by a rim at the top, surmounted by a dished cover or dome of transparent plastics such as PVC, and having a precurved rim which locks on to the rim of the main trough. W&Co

12

Influence of pressurization on binding strength of turkey meat rolls stuffed in membrane casings.

Meydav, S.; Toledo, R. T.; Carpenter, J. A.

Journal of Food Science 44 (1) 298-299, 301 (1979) [9 ref. En] [Dep. of Food Sci., Univ. of Georgia, Athens, Georgia 30602, USA]

The influence of pressurization on binding strength between meat pieces stuffed into membrane casings was evaluated using a pneumatic pressurization device. The device simulated the action of a pneumatic machine that is commercially available and is now used by the industry. The contents of a stuffed casing were pressurized when the open end was twisted and inserted through a 1 cm diam. opening on a fixed Al ring and pulled by an air cylinder piston to which the casing was attached. Using theoretical considerations, an equation was derived for determining internal pressure in a stuffed roll based on the principle that the pressure developed is a function of the unit strain on the casing. This principle was verified experimentally by monitoring internal pressures in a casing filled with a viscous fluid and connected to an Hg manometer. The internal pressure was linear in a plot against the reciprocal of the outside diam. of the roll. The regression equation was used to calculate internal pressures in a casing stuffed with meat from the measured outside diam. Interfacial binding evaluated as failure force in uniaxial tension decreased slightly with increasing pressures in the roll $> 5.7 \text{ lb/in}^2$. The decrease was insignificant in rolls made from frozen meat but was significant in rolls made from fresh meat. In unpressurized rolls, increased incidence of pockets filled with cookout fluid was observed. Pressurization to $2-5 \text{ lb/in}^2$ internal pressure appears to be optimal in terms of elimination of pockets filled with cookout fluid and max. interfacial binding between meat pieces. IFT

13

Influence of starting ration energy-protein ratio and fat content on finish grade of early and late marketed broiler tom turkeys.

Moran, E. T., Jr.

Canadian Journal of Animal Science 58 (4) 605-614

(1978) [24 ref. En, fr] [Dep. of Anim. & Poultry Sci., Univ. of Guelph, Guelph, Ontario N1G 2W1, Canada]

Commercial source broiler-type male poulters were offered starting rations having energy (kcal metabolizable energy (ME)/kg)-protein (%crude) ratios either above (100) or below (90) the optimum (95). In each case, total fat comprised a high (28%) or moderate (14%) amount of dietary ME. All rations contained 30% protein from constant proportions of soybean meal, corn and corn gluten meal while energy and fat were varied with animal-vegetable tallow, starch, glucose monohydrate, and purified cellulose. Common corn-soybean meal rations were fed from 2 wk of age to slaughter at 12 and 16 wk. Effects of starting diets on finish were detected at 16 but not 12 wk of age. A statistically significant improvement in back finish occurred when 28% rather than 14% of the ME was provided by fat regardless of energy-protein relationship. No differences attributable to ratio or its interaction with dietary fat were apparent. Treatment effects on breast grades paralleled those on back finish but were not statistically significant. SP

14

Salmonella and E. coli isolated from turkey processing plants, their antibiotic sensitivity patterns and the transfer of drug resistance.

Nivas, S. C.

Dissertation Abstracts International, B 37 (10) 4892-4893: Order No. 77-6985, 274pp. (1977) [En] [Univ. of Minnesota, Minneapolis, Minnesota 55455, USA]

A study in 3 plants examined the Salmonella-Arizona (S-A) load brought in by turkeys, S-A dissemination in the plants, and presence of S-A on turkey carcasses just after evisceration. Results indicated the following: cloacal swab isolations of S-A were variable; defeathering machines showed the greatest contamination; isolations from environmental samples usually reflected the S-A load brought in by turkeys; S-A were isolated from turkey carcasses. Measures for minimizing S-A load on carcasses are suggested, e.g. steam-scalding and chlorination of water. Further studies examined: antimicrobial susceptibility of Salmonella and Escherichia coli (EC) isolates obtained from lactose broth rinsings of eviscerated turkeys; in-vitro and in-vivo transfer of antimicrobial drug resistance from multi-resistant EC and Salmonella donors onto multiply-sensitive EC and Salmonella recipients; spread of infectious drug resistance in contacts of infected turkeys; phage-type changes in Salm. typhimurium (ST) isolates after pick-up of drug resistance markers; shed of ST from turkeys orally infected with chlortetracycline (CTC)-sensitive ST and given CTC in the feed; and emergence of resistant ST. JA

15

[Study on improvement of roast turkey quality.]

Mroczyk, J.; Rejt, J.; Adamczyk, P.

Przemysł Spożywczy 32 (11) 421-424 (1978) [8 ref. Pl, ru, en, fr, de] [Inst. Tech. Żywności, SGGW-AR, Warsaw, Poland]

Carcasses of medium white wide-breasted turkeys obtained at random from the day's production of the Ilawa (Poland) poultry factory (wt. 3.4-4.6 kg) were

salted by rubbing 50 g salt into the skin and inner body surface, and injected within 30 min of slaughter into the breast muscle with $\leq 10\%$ of carcass wt. of freshly made emulsions of either 80% soybean oil and 20% brine (30% NaCl) or 80% lard glycerides liquid at 27°C and 20% brine, Admul 1380 monostearate being used as emulsifier; the carcasses were then weighed, packaged in foil, ripened at 8°C for 24 h and roasted in an electric oven with 2-side heating at 160°C until a temp. of 85°C was reached in the thickest muscle; the carcasses were then weighed and breast muscles were examined by sensory analysis on a 5-point scale for tenderness, juiciness, aroma and taste, and contents of protein, fat, moisture and chlorides were determined. It is concluded from results tabulated or graphically presented in detail that injection increased roast carcass yield by 5% in comparison with control carcasses; that both types of injection increased tenderness, but that the lard/brine emulsion proved better for juiciness, aroma and taste than the soybean oil/brine emulsion; and that use of such emulsions should be of practical value in the poultry industry. SKK

16

A comparison of five cure procedures for smoked turkeys.

Wisniewski, G. D.; Mauer, A. J.

Journal of Food Science 44 (1) 130-133 (1979) [26 ref. En] [Dep. of Poultry Sci., Univ. of Wisconsin, Madison, Wisconsin 53706, USA]

4 methods of curing-smoking turkeys were compared to a conventional brine-smoked turkey process for their effects on product yield, salt and moisture levels, pH, colour, shelf life, and sensory attributes. Dry curing followed by smokehouse cooking provided a moist acceptable product. Liquid smoke brining for smoked turkey was not as well received. Treatments of dry curing plus smoking and conventional brining plus roasting resulted in low bacterial counts and high TBA values; conventional brining plus roasting provided a less desirable external appearance. Based on TBA values and desirability, a brine-smoke combination seems likely to give the most acceptable product. IFT

17

S-nitrosocysteine (RSNO), an effective antioxidant in cured meat.

Kanner, J.

Journal of the American Oil Chemists' Society 56 (2) 74-76 (1979) [22 ref. En] [Div. of Food Tech., Inst. for Tech., Volcani Cent., PO Box 6, Bet Dagan, Israel]

S-nitrosocysteine (RSNO), a compound which has been shown to be generated during the curing process of meat, was found to act as an antioxidant. The antioxidative activity of RSNO in an aqueous linoleate model system, in the presence of myoglobin, was compared with that of other known antioxidants, such as butylated hydroxytoluene (BHT) and α -tocopherol. The results indicated that RSNO has an antioxidative activity only slightly lower than that of BHT. During the initial stage of the reaction, RSNO acted not only as an inhibitor of linoleic acid oxidation, but also as a hydroperoxide decomposer. The high inhibitory effect of added RSNO (1mm/kg meat) on lipid oxidation in

ground cooked turkey meat was demonstrated in the product itself. AS

18

The effect of storage temperature on the shelf-life of eviscerated air-chilled turkeys.

Barnes, E. M.; Impey, C. S.; Geeson, J. D.; Buhagiar, R. W. M.

British Poultry Science 19 (1) 77-84 (1978) [12 ref. En] [Food Res. Inst., Colney Lane, Norwich NR4 7UA, UK]

Eviscerated air-chilled turkeys (weighing about 5.5 kg) were stored in groups of 10 at temp. between 5 and -2°C . Slight "off" odour was detected in an average time of 7.2 days at 5°C, 13.9 days at 2°C, 22.6 days at 0°C and about 38 days at -2°C . The microbiological condition of the carcasses was determined initially and after storage at -2°C for 28, 35 and 42 days. It was found that, whilst pseudomonads (pigmented and non-pigmented) were present at $10^8/\text{cm}^2$ after 35 and 42-days storage, yeasts were also present at $10^7/\text{cm}^2$ and probably accounted for the unusual fusty "off" odours. AS

19

Quality of ground turkey patties.

Korschgen, B. M.; Baldwin, R. E.; Vandepopuliere, J. M.; Russell, W. D.

Poultry Science 57 (1) 111-115 (1978) [4 ref. En] [Dep. of Food Sci. & Nutr., Univ. of Missouri-Columbia, Columbia, Missouri 65201, USA]

Tests were conducted to assess the influence of ground pork, fat levels, cooking procedures and selected seasonings on the quality of ground turkey patties. Cooking losses were greater for turkey and turkey:pork (75:25) patties which were grilled than for those that were breaded and deep-fat fried. As % of ground pork increased, cooking losses increased and diam. of patties decreased. Cooking losses were greater for turkey:pork patties containing 25% fat than for those with a 16.5% fat level. Untrained panelists liked patties composed of combinations of turkey:pork (100:0, 75:25, 50:50, 25:75, and 0:100). Although pork tended to increase juiciness of patties, mean panel scores were not improved significantly by changing fat levels. Use of a liquid meat seasoning significantly reduced the general acceptability of patties. AS

20

Evaluation of various mixing stresses on storage stability (TBA) and color of mechanically deboned turkey meat.

Uebersax, M. A.; Dawson, L. E.; Uebersax, K. L.

Poultry Science 57 (4) 924-929 (1978) [13 ref. En] [Dep. of Food Sci. & Human Nutr., Michigan State Univ., E. Lansing, Michigan 48824, USA]

Mechanically deboned turkey meat (MDTM) was mixed under the following treatment conditions: (i) control (not mixed), (ii) exposed to surface air, (iii) under a flow of N_2 gas, and (iv) under a flow of CO_2 gas. 2.5 kg of MDTM were mixed in replicate in a Hobart K5-A mixer in a 4°C cold room. Treatments were intended to simulate several handling conditions and to provide various oxidative stresses to the product. Treated MDTM was packaged in Mylar pouches without air

evacuation and under vacuum and held at 4°C for ≤6 days and stored at -18°C for ≤6 months. Samples were evaluated for surface colour (Hunter Lab) and for storage stability (2-thiobarbituric acid, TBA) at regular intervals. Data indicate that mixing contributes to colour and oxidative changes which occur during storage. Dramatic TBA increases were only noted for MDTM held at 4°C for ≤6 months. TBA numbers of MDTM held at 4°C for ≤6 days did not change appreciably. Generally, meat mixed in (ii) and (iv) showed higher TBA numbers and greater changes in surface colour than did the control meat and meat mixed under (iii). Further work is required to make conclusive statements applicable to commercial procedures. AS

21

Storage stability (TBA) of meat obtained from turkeys receiving tocopherol supplementation. Uebersax, M. A.; Dawson, L. E.; Uebersax, K. L. *Poultry Science* 57 (4) 937-946 (1978) [11 ref. En] [Food Sci. & Human Nutr. Dep., Michigan State Univ., E. Lansing, Michigan 48824, USA]

20 female and 20 male broad breasted turkeys were raised to 18 wk and 20 wk, resp. D-α tocopherol acetate was supplemented in vivo from 12 wk to slaughter through diet (100 IU/kg feed) or through biweekly subcutaneous injections. Storage stability of meat was evaluated by the 2-thiobarbituric acid test (TBA). Samples of breast meat, thigh meat, and mechanically deboned turkey meat (MDTM) were held at 4°C for ≤6 days and stored at -18°C for ≤3 months. Loaves formulated from breast meat and MDTM were foil wrapped, vacuum sealed, and either held at 4°C for 1 wk or stored at -18°C for ≤6 months. Stored loaves were evaluated raw and after cooking. TBA numbers were consistently lower for tocopherol-supplemented turkey meat than for control meat. Dietary supplementation was more effective than injections for maintaining low TBA numbers. TBA numbers of meat types increased from breast meat to MDTM to thigh meat, and TBA numbers of each type increased over time. Meat from females generally had TBA numbers lower than meat from males. Meat loaves prepared from tocopherol supplemented meat had TBA numbers lower than control loaves for both storage conditions. Loaves vacuum packaged had TBA numbers lower than those foil wrapped. Both packaging conditions resulted in increased TBA numbers with cooking and storage time at -18°C. Tocopherol supplementation increased the storage stability as evaluated by the TBA test for all evaluated meat types (including loaves) and storage conditions. Vacuum packaging further improved stability of loaves. AS

22

Effect of skin content on some properties of poultry meat loaves.

Acton, J. C.; Dick, R. L. *Poultry Science* 57 (5) 1255-1259 (1978) [31 ref. En] [Dep. of Food Sci., Clemson Univ., Clemson, S. Carolina 29631, USA]

Poultry loaves were prepared with turkey thigh meat and proportions of skin ranging from 10% to 50% of

formulation. Raw mixes were prepared for extrusion using the FTC back extrusion cell. After cooking to 78°C internally, loaves were evaluated for Gardner colour values, cooking losses, shear forces, and composition of the meat and meat exudate. Extrusion force values were 9.2 to 9.3 kg for loaves made with ≤30% skin and then significantly ($P < 0.5$) decreased as the skin content increased to 50%. Cooking losses significantly ($P < 0.5$) increased as the skin content of the loaves increased, due primarily to the shift in moisture and fat ratios of the mixes. The collagen content of the loaves and exudate (when summed) reflected the content of skin used in preparation. Shear forces were similar for all treatments, averaging 0.112 kg force/g-cm² of sample. Loaves examined for bind and tensile strengths showed maximum bind values (panel) at 33% skin and max. tensile strength (instrumental) at 33% to 50% skin. Gardner L and b_L values were not affected by skin content. The a_L (redness) values decreased as skin levels increased during early storage, but had become nearly equal by 8 days of storage in closed loaf pans. The fluid drip (exudate) had an N content of approx. 0.6% with 0.5-0.6% as nonprotein N. AS

23

High pressure liquid chromatographic determination of furazolidone in turkey tissue.

Hoener, B.-A.; Lee, G.; Lundergan, W. *Journal of the Association of Official Analytical Chemists* 62 (2) 257-261 (1979) [9 ref. En] [Dep. of Pharmacy, School of Pharmacy, Univ. of California, San Francisco, California 94143, USA]

A high pressure liquid chromatographic method for determining furazolidone in turkey tissue was developed. Tissues are ground with methanol and centrifuged. For lower levels of furazolidone, 2-40 parts/billion, the supernate is evaporated to dryness and redissolved before it is injected onto the liquid chromatographic column. Using a reverse phase column and a UV absorption detector set at 365 nm, the assay is linear over the concn. range 2-400 parts/billion with a coeff. of variation of <4%. Average recovery from fortified tissues was 96% with a coeff. of variation of 6% at the 50-400 parts/billion level, and 105% with a coeff. of variation of 11% at the 2-40 parts/billion level. AS

24

[Use of measurements of breast muscle and subcutaneous fat thickness for estimation of leanness and fatness of turkey carcasses.]

Bochno, R.; Michalik, D. *Roczniki Naukowe Zootechniki* 6 (1) 45-54 (1979) [13 ref. Pl, en, ru] [Inst. Genetyki i Metod Doskonalenia Zwierzat, ART, Olsztyn, Poland]

33 14-month-old hen turkeys of the White Broad-Breasted breed were used in a study on the relation between breast muscle thickness and back fat thickness (measured with a needle probe on live animals and carcasses) and carcass quality. Tables of data are given for the body wt., breast muscle thickness and back fat thickness (of live birds and warm and cool carcasses), and wt. and % of lean, skin + subcutaneous fat and

bone in the carcass; correlations of body wt., breast muscle thickness measurements or back fat thickness measurements with measures of carcass leanness and fatness are also given. Correlation of breast muscle thickness of cooled carcasses with lean meat wt. ($r = 0.604$) was higher than correlations of live-bird breast muscle thickness or body wt. with lean meat wt. ($r = 0.581$ and 0.513 , resp.). Back fat thickness of live birds was not significantly correlated with tissue composition of the carcass; however, back fat thickness of the carcass was significantly correlated with subcutaneous fat wt. ($r = 0.695$) and % lean ($r = 0.656$). [From En summ.] AJDW

25

Effects on turkey broiler performance and carcass quality by superimposing toenail-clipping upon debeaking after established development.

Moran, E. T., Jr.

Canadian Journal of Animal Science 59 (2) 327-332 (1979) [7 ref. En, fr] [Dep. of Anim. & Poultry Sci., Univ. of Guelph, Guelph, Ontario N1G 2W1, Canada]

Broiler-type turkey poults were placed sex-separate in floor pens (60 birds/pen; approx. $5.5/\text{m}^2$) of an environment-controlled house. All birds received corn-soybean meal based rations paralleling commercial practice. Treatments were imposed at 5 wk of age and involved either debeaking alone (controls) or its combination with toenail-clipping (6 pens/sex/treatment). Body wt. of nail-clipped turkeys was less at 6 and 10 wk than found with controls; however, the converse was observed by slaughter at 14 wk. Conversion of feed consumed during the 6 to 10- and 10 to 14-wk intervals was more efficient with nail-clipped than control birds. Mortality was similar between both groups from starting through to the finishing period whereupon noticeably fewer deaths occurred with nail-clipped as opposed to control turkeys. Dressed carcass yield was greater when nail removal was performed than not. A 40% reduced incidence of utility grades indirectly suggested that this yield advantage was due to less "on the line" trimming during processing. Conformation, fleshing and finish grades were unaltered. Both sexes responded comparably. All advantages arising as a consequence of toenail-clipping could be explained in terms of reduced flock activity. AS

26

Vitamin B₁₂ and folic acid content of raw and cooked turkey muscle.

Molonon, B. R.

Dissertation Abstracts International, B 39 (1) 168: Order no. 78-11431, 63pp. (1978) [En] [Kansas State Univ., Manhattan, Kansas 66506, USA]

Raw and cooked (roasted or braised at oven temp. of 93° and 177°C to an internal temp. of 85°C) turkey pectoralis major muscle and drip were assayed for vitamin B₁₂ and folic acid; cooking time, cooking losses and meat composition were also determined. Cooking time was longer for roasting than braising and longer for roasting at 93°C than at 177°C. Total cooking losses were greatest for meat roasted at 93°C. Volatile losses

were greater with roasting than with braising, greater with roasting at 93°C than at 177°C, and greater with braising at 177°C than at 93°C. Drip loss for braised meat was greater than that for roasted, and also greater at 93°C than at 177°C. Cooked meat contained less moisture than raw meat and hence apparent protein content was higher than raw meat. Braised meat contained more moisture than roasted meat. Meat roasted at 93°C contained the most vitamin B₁₂ on an edible wt. basis, but on a moisture-free/fat-free basis, meat cooked at 177°C contained less, and the resultant drip more, vitamin B₁₂ than raw meat and meat cooked at 93°C. Cooking had no effect on folic acid content. JA

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Modern turkey processing.

Anon.

Food Trade Review 48 (9) 528 (1978) [En]

A description is given of turkey processing at Edward Webster's new plant at Rainford, UK. The plant, which is constructed to EEC standards, has boning room and chiller capacity for several thousand turkeys. VJG

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